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UNITED STATES DEPARTMENT OF AGRICULTURE
MISCELLANEOUS PUBLICATION No. 160

WASHINGTON, D.C. ★ October, 1933

# DESCRIPTIONS OF TYPES OF PRINCIPAL AMERICAN VARIETIES OF TOMATOES

Prepared jointly by specialists of the United States Department of Agriculture and of the Agricultural Experiment Stations of California, Indiana, Michigan New York (Cornell), and Texas

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# DESCRIPTIONS OF TYPES OF PRINCIPAL AMERICAN VARIETIES OF TOMATOES

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## INTRODUCTION

This publication is the first of a series planned for issuance over a period of years relative to types of American varieties of vegetables. On account of a lack of any generally accepted, authentic, and adequate description of even the most important of vegetable varieties, there has been great disagreement and some confusion as to exactly what characteristics a certain variety should possess. Members of the seed trade who deal in vegetable seeds, as well as farmers, canning-factory operators, and market gardeners who buy vegetable seeds, have long desired and urgently requested that the United States Department of Agriculture undertake exhaustive studies and issue adequate descriptions of the most widely used varieties. The sustained interest, generous cooperation, and constructive criticisms of these agencies have greatly helped the Department and the cooperating State experiment stations in initiating this work and carrying it to its present stage of development. The authors of this publication gratefully acknowledge the assistance that has been given them.

## HOW THESE TYPES AND DESCRIPTIONS WERE ESTABLISHED

This work is designed to present the consensus of opinion of the seedsmen, vegetable growers, canners, and horticulturists in the United States who are most familiar with tomato varieties as they are, and who are best qualified to judge what type should be established as a standard. Practical rather than theoretical considerations have been the basis of the procedure followed. The standard presented for each variety is not an imaginary ideal impossible of attainment, but is a representation based upon a stock actually in existence. It is true that no stock has been found every plant and fruit of which will conform to the standard described, but it is possible to improve certain stocks that approach the ideal type until a satisfactorily high percentage of plants and fruits are in close agreement with the standard.

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[1] The names of the joint authors who collaborated in the several States are listed according to the alphabetical order of the names of the cooperating institutions as a matter of convenience, since it is not possible to list them in any order of rank or seniority. This publication represents the joint efforts of all the authors, aided by the criticisms and suggestions of the various agencies referred to herein. Although it is offered without apology, the authors recognize that it represents an entirely new and untried kind of service to growers and users of vegetable seeds and vegetable products.

Numerous conferences and discussions with representatives of the seed industry, the canning industry, and market-gardeners' and truck-growers' organizations, as well as with Federal and State agricultural workers all over the country were held to determine the greatest needs that could be fulfilled by this "vegetable variety standardization and description" work. What the various industries most desire at this time is a treatment of the few, well-established, important, and distinct varieties that constitute most of the acreage and value. It is conservatively estimated that the nine varieties of tomatoes herein described include 85 or probably 90 percent of all the tomatoes grown in the United States. It is generally agreed that a proper consideration of the scores of varieties of minor commercial importance, but of great horticultural and genetic interest would require vastly more time and greater resources than are now available; and, important as that problem is, for some time it must be considered secondary to a careful delimiting of the present dominant varieties.

After determining the list of varieties to be considered, groups of Federal and State workers jointly devised the methods of work. Several of the best available stocks of each of the different varieties were then obtained from numerous seed growers all over the country, through the generous assistance of the vegetable research committee of the American Seed Trade Association.

A total of 18 crops of tomatoes in 6 widely separated States, over a period of 3 years, were grown. Exactly the same stocks were available to all workers for the entire period. In order to avoid possible prejudice, stocks were identified only by number, and the sources were unknown. Methods of growing in various locations were identical, with certain exceptions that were necessary in the irrigated regions. All methods of observation, recording data, and description were uniform, according to a prearranged plan. Field trips to different States were made by the workers during the harvest season so as to observe and discuss variety types and variations in type caused by cultural conditions and climate. Winter conferences were held, where data and photographs were gathered together and decisions were based upon results obtained all over the country. Tentative descriptions and illustrations were prepared in the fall of 1930, after two seasons' work, and sent to the vegetable research committee of the American Seed Trade Association and to all collaborators for criticism and comment. These criticisms were used in making certain corrections and in carefully verifying the descriptions in the field in the various locations in 1931.

## DEVELOPMENT OF IMPROVED VARIETIES IS NEEDED

The describing in this publication of the few dominant varieties of tomatoes must not be interpreted to mean that these varieties meet all possible requirements of the trade perfectly and that new and improved varieties are not needed. These definitions of the present most important varieties should in no way discourage the breeding of new and distinct sorts, so long as the new kinds are really different and really better than those now existing. There is no merit in a new variety merely by virtue of its being different from others; it must meet specific requirements that other varieties cannot meet, if it is to deserve consideration. Furthermore, an improvement in yielding capacity alone, or in yield and uniformity, of one of the present types is not justification for claiming it is a new variety. Differences should be qualitative (differences in kind, with reference to a character or characters) as well as quantitative (differences in degree) and must be such that they can be clearly described and easily recognized.

## WHAT THESE DESCRIPTIONS WILL ACCOMPLISH

It is hoped and generally believed that the publication of these descriptions will have several desirable results: (1) All stocks of seed of the varieties described can eventually be made to approach the established and generally recognized type, with the result that varieties can be ordered by name with confidence that the desired type will be obtained; (2) thorough familiarity with the important varieties for which types have been established and adequately described will facilitate detection of misnamed and renamed stocks; (3) familiarity of the buying public with the few really different and important varieties that are required to meet most general market and home-garden demands should eliminate from present seed lists hundreds of names of so-called varieties which often are not distinctly different and rarely are superior to good strains of established sorts. If growers learn the merits of the standard varieties and cease demanding the numerous things of minor importance it will be practicable for the seed grower to reduce the number of stocks that he must carry in order to meet buyers' demands. This in turn will simplify production and handling and will permit the seed grower to devote more attention to the chosen varieties, with a resultant improvement in commercial stocks.

It must be emphasized, however, that the attainment of these objectives is dependent upon the entirely voluntary action of all persons concerned. Growers and seedsmen have expressed their desire for such a definition of varieties as is here presented, in the belief that it would guide them in their informal, voluntary cooperative efforts to accomplish the unquestionably desirable ends outlined above.

## EFFECTS OF ENVIRONMENT

All descriptive terms and values presented here, unless otherwise stated, apply to the standard or type of the variety in question as it appears under most conditions where that variety is grown. The descriptions apply to plants grown without pruning. Extreme variations in a character which result from obviously unfavorable conditions were given little weight in establishing the limits of the standard type. Likewise, if a certain location or season produces unusually favorable results with reference to size, quality, yield, or other factor, with results that reasonably cannot be expected year after year or in other regions, those results are considered not typical and so were given little weight. However, extremes of behavior were considered, and special mention is made of them when necessary to fulfill the objects of this work.

### TIME OF MATURITY

As the effects of temperature and moisture upon the rate of plant growth and development are generally recognized, it should be readily understood why, in describing the standard for a variety, rather wide limits are allowed for its time of development in different regions.

Under certain exceptional conditions of climate and methods of culture all the varieties described may bear the first ripe fruits at practically the same late date and reach their respective peak harvests within a week of one another. In parts of western Texas, for example, high temperatures and low humidity prevail for a considerable period, with the result that no fruit is set, but vegetative growth continues vigorously. With the arrival of weather that is cooler and otherwise more favorable, fruit setting begins with all varieties more or less simultaneously. The time required for the development and ripening of fruits after fruit setting does not vary markedly among varieties; and therefore both early and late varieties simultaneously may ripen. The varieties more resistant to these unfavorable conditions will of course bear the larger yields of early fruit.

### SIZE OF PLANT AND LEAVES

Typical plants can be expected only on lands fertile enough to produce normally profitable yields of the crop in question and under conditions of management and weather that experience has shown usually produce favorable results. Good judgment and a spirit of fairness must be used in considering such factors before a stock is condemned as being off type or before a bad stock is defended on the ground of unfavorable environment.

In general, leaf characters of any variety are rather variable, and by themselves are of little or no value in identifying a variety. The appearance resulting from habit of growth of the plant is usually rather characteristic and is often a good basis for identification of certain varieties, but leaf characters alone must not be confused with the total effects of plant habit and color that give a variety a characteristic appearance. Leaf variations and similarities substantiating these statements are shown in plates 7, 15, 16, 19, and 23.

Size is probably the most variable character. Poor soil or drought obviously may result in sizes of entire plant and sizes of leaves that are below those indicated for the ideal type. Very often these conditions not only decrease the size of plants but also alter rather markedly the general appearance of the plant as a whole. Environment conducive to excessive vegetative growth may result in such rank leaf and stem development as to change characters other than size, making accurate identification very difficult. These conditions are usually accompanied by a greater number of branches than is typical for the variety in most regions. This effect is less commonly found than variations in size but must be taken into account whenever a stock appears to be off type. Under low-temperature or drought conditions leaf development tends to be sparse, resulting in exposure of the fruits to the sun. Dry weather and other factors conducive to poor growth also result in leaves being narrower in proportion to their length than under more favorable conditions. With an abundance of moisture, fertile soil, and temperatures that result in excessively large vine growth, the plants generally tend to be more sprawling and therefore spread farther than usual in proportion to their height, but not always are the plants more sprawling under such conditions of soil and climate. In some regions, as in southern Texas, the plants are set rather closely in the row to afford mutual protection from the wind and to increase the shading of the fruits from the sun. When this is done, the plants are taller and more erect than is typical of most varieties. At the same time the maximum spread is also greater than usual. The foliage of such plants is usually extremely heavy, hiding the fruits from view early in the season. Such plants of some varieties are often unproductive because the factors causing excessive plant growth are also conducive to unfruitfulness. On the other hand, unfavorable weather conditions which destroy or prevent the set of fruit on the first few clusters may be followed by an excessive vine growth which is not characteristic of the variety.

### SIZE AND SHAPE OF FRUITS

As stated previously, actual size usually varies much more than do the proportions or shapes of the plant or individual parts of the plant. The effects of poor soil or climate upon size of fruit is too commonly observed to require discussion. Under conditions which prevent the attainment of desirable size of fruits and which retard plant growth, fruits are often deeper, that is, the polar diameter is greater in proportion to the equatorial diameter than usual. On the other hand, if there is excessively rank growth of plants the fruits often are of an abnormally large diameter in proportion to their depth, and therefore proportionally flatter than usual. Such flattened fruits are usually distinctly rougher in appearance, have deeper cavities and basins than is typical, and also very pronounced creases and ridges.

Although these differences in fruit shapes under different degrees of moisture, fertility, and temperature are pronounced in extreme cases, they are not so great under good tomato-growing conditions as to preclude the possibility of identifying the varieties listed. The fruits of most varieties tend to be slightly proportionally deeper in the Northern States than in the Southern and Pacific Coast States. This difference, however, does not appear to be so great as to make impossible the development of a single stock which will meet the description of the variety over a wide range of conditions. Tomatoes are grown in semiarid, hot southwestern regions to which they are not well adapted and where excessive vine growth and low yields prevail. Under these conditions many varieties appeared very different from the same varieties in certain other parts of the United States and could hardly be identified by previously existing descriptions. Special consideration has been given to such instances. The allowable limits of variation set forth in the descriptions are designed to include the slight unavoidable differences that exist between different regions and under different conditions of soil fertility.

### NUMBER OF FRUITS PER CLUSTER

The figures given upon the number of fruits per cluster in the ensuing variety descriptions will appear abnormally low to persons accustomed to counting fruits on staked and pruned plants. It must be understood that these counts are based on plants allowed to grow freely on the ground without pruning or staking and are based upon counts made under a wide variety of conditions over a period of two years.

### COLOR

Marked plant-food deficiencies will result in poor color of foliage. In general, a lack of nitrogen causes lighter greens than are typical for the several varieties; on the other hand, a marked shortage of phosphorus or potassium often results in a darker green than usual. Excessively dry conditions will result also in a lighter color of foliage when plants are viewed from a distance, this effect being due chiefly to the curling of leaves and the showing of the lighter-colored undersurfaces. A slight bloom may also develop upon the leaf surfaces during a period of drought.

Typical colors of fruits have been recorded for the full-ripe stage rather than the stage ripe enough for picking for market, except for the varieties Globe and Gulf State Market. Both of these stages of ripeness are indicated for these varieties. Tomatoes as ordinarily harvested are not fully ripe and so should not be compared with the color values given for fully ripe fruits.

It has been found that the red color in the tomato fruit does not always develop well at temperatures above 86° F. Under abnormally high temperatures or exposure of the fruits to the sun the characteristic rich color of the variety may not develop. Varieties that are of a rich, brilliant scarlet color in the middle and northern regions of the country often tend toward grenadine under the high summer temperatures of the South and Southwest.

## IMPORTANT CONSIDERATIONS IN COMPARISONS OF TOMATO STOCKS OR STRAINS WITH THE PUBLISHED STANDARDS

In addition to considering the points brought out under the heading Effects of Environment, it is necessary to observe certain precautions in making comparisons between varieties or between a variety in the field and the description of the standard in the following pages.

Varieties to be compared must be grown under as nearly identical soil and cultural conditions as possible, especially if earliness and yield are important. Close comparisons should not be attempted between rows widely distant in the field unless duplicate or triplicate plantings are made.

All varieties must be planted at the same time and transplanted to the field on the same day if possible.

Plants for transplanting must be carefully grown so that all lots have an equal chance for making a strong, stocky growth. They should be transplanted when 4 to 6 inches tall and before any blossoms appear.

In general, the plants should be given sufficient space in the field so that the branches of adjacent plants will not meet in the row until after harvesting is well under way.

Plant habit can best be observed about the time the first fruit ripens. Later than that, the weight of the fruits usually pulls most of the branches down to the ground, destroying the characteristic habit of growth of the variety. Disturbance of the plant in harvesting the fruit, advancing age, and the occurrence of pests, diseases, and unfavorable weather all tend to destroy certain characteristic features, thus making plant identification difficult or impossible late in the season.

The time of appearance of the first individual ripe fruit in a strain is not a good index of earliness. Earliness should be based on the time required for enough fruits in a strain to attain ripeness to yield at a rate comparable to one or more commercial harvests.

Under most conditions tomato plants yield fruits which are most characteristic of the variety and are less variable during the peak or soon before the peak of production. Neither the very earliest nor latest fruits borne are representative of the plant which bears them.

A strain cannot be fairly judged or always properly identified by observing only a few fruits or a few plants. If a strain contains a small proportion of mixtures or off-type plants these should not be included in the characterization of the type of the strain, but the presence of mixtures should be noted. If a strain is obviously badly mixed or extremely variable, an attempted characterization is of little or no value. From strains uniform enough for characterization, two or three representative fruits from each of 15 to 20 plants and the plants bearing these fruits should be chosen as a basis for comparison.

The observing and recording of colors is especially difficult without the use of color standards which are designed for this purpose. Colorblindness obviously causes some trouble, and furthermore, lack of training or experience in observing and comparing colors may be an obstacle. Printed or painted standards in book form can be used with a degree of success.

In matching colors of leaves or fruits with the small colored areas of the standard, great care must be taken. A piece of the object should be held as closely to the surface of the standard as possible, with precautions against marring or soiling the standard. The surfaces of the object and the standard must be parallel to each other and illuminated by daylight, preferably on a clear day, but not by the direct rays of the sun. If these comparisons are made indoors, light from a north window is best. The surfaces of the object and standard should be held so that the uninterrupted light of the sky strikes them at an angle of 40° to 50°.

If a high degree of accuracy of comparison is required, an artificial light source of 6,300° Kelvin provides a constant illumination and can be obtained at a reasonable price.

Satisfactory color comparisons cannot be made by memory. Furthermore, the apparent color of an object depends largely on the background against which it is observed, as well as on the light falling upon it. The shape of an object, surface irregularities, shadows, and even the area of the colored surface observed contribute to the impression of color. Careful reference to a known standard is the only practicable way of obtaining a record of color in the field.

In observing large masses of color in the field the observer should stand facing as nearly directly away from the sun as possible.

The numerical designations of color values appearing in this publication are those used in A Dictionary of Color.[2]

The principal characteristics of the nine varieties of tomatoes described in this publication are given in table 1.

TABLE 1.—*Outstanding characteristics of the principal varieties of tomato*

| Item | Earliana | Bonny Best | Gulf State Market | Globe | Marglobe | Early Detroit | Greater Baltimore | Stone | Santa Clara |
|---|---|---|---|---|---|---|---|---|---|
| Chief use | Home and market. | Home and market. | Market | Market | Market; canning. | Market | Canning | Canning | Canning. |
| Season | First early | Second early | Early midseason. | Midseason | Midseason | Midseason | Late midseason. | Late | Late. |
| Time from transplanting to harvest (days). | 55–65 | 63–73 | 66–76 | 70–80 | 70–80 | 70–80 | 73–83 | 75–90 | 85–100. |
| Plant size | Small | Medium | Medium | Large | Large | Medium | Large | Large | Large. |
| Leaf size | do | do | Medium large | do | do | Medium large | Medium large. | Very large | Do. |
| Leaf color (green) | Medium | do | Light | Light | Medium | Medium | Medium | Dark | Medium. |
| Growth habit | Sprawling | Semierect spreading. | Semierect spreading. | Semierect spreading. | Semierect | Semierect spreading. | Semierect spreading. | Erect | Sprawling. |
| Foliage density | Open | Slight | Medium | Medium | Dense | Dense | Dense | Very dense | Dense. |
| Immature fruit, color. | Green streaked | | | | | | | | Green streaked. |
| Fruit size..ounces | 4½–5½ | 4½–5½ | 5–6 | 6–7 | 6–7 | 5½–6½ | 6–7 | 6½–7½ | 9–12. |
| Fruit shape | Deep oblate | Deep oblate | Globular | Globular | Globular | Flattened globular. | Flattened | Deep flattened | Flattened. |
| Corky ring | Inconspicuous | Inconspicuous | Conspicuous | Negligible | Conspicuous | Conspicuous | Conspicuous | Conspicuous | Conspicuous. |
| Stylar scar | Medium | Mere dot | Small | Small | Small | Medium | Large | Medium | Very large. |
| Outside color | Scarlet with yellow. | Grenadine red | Scarlet red | Scarlet red | Scarlet with grenadine. | Scarlet red | Scarlet | Scarlet | Scarlet. |
| Inside color | Scarlet red with orange. | Medium scarlet red. | do | do | Scarlet red | do | Scarlet red | Scarlet red | Scarlet red. |
| Cells.....number | 10–12 | 6–7 | 5–6 | 5–6 | 6–7 | 6–7 | 7–9 | 7–9 | 15–25. |
| Cell arrangement | Irregular | Regular | Regular | Regular | Regular | Regular | Irregular | Irregular | Regular and irregular. |

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[2] MAERZ, A. J., and PAUL, M. R. A DICTIONARY OF COLOR, 207 p., illus. New York. 1930.

## EARLIANA

### BRIEF CHARACTERIZATION

A home and market garden variety that is adapted to all regions where tomatoes are grown.

Early; plant and leaves small, medium green, branches few, sprawling, fruits exposed. Flowers per cluster, numerous; sepals 7 to 9. Immature fruits, stem end dark green until nearly ripe; dark-green streaks radiate from stylar scar.

Ripe fruits deep oblate, medium size, 4½ to 5½ ounces; cross section slightly oblong; greatest diameter 2½ to 2¾ inches, depth 2 to 2⅛ inches, or about 77 percent of diameter. Cavity medium size, smooth; corky ring, inconspicuous. Basin absent; stylar end well rounded or slightly protuberant; stylar scar medium. Outside color scarlet, becoming yellowish scarlet near stem end and having yellow-orange streaks radiating from stylar scar. Inside color medium scarlet red, tending toward orange. Outer walls thin; inner walls medium. Cells 10 to 12, irregular.

Circular cracks are common; radial cracks, rare.

### ADAPTABILITY AND USE

Earliana is suited to culture in all regions of the United States where tomatoes can be grown. Especially valuable in regions of short season. A first-early home- and market-garden variety; shipped to a limited extent.

### SEASON

Early; generally 55 to 65 days from transplanting medium-sized plants that have not reached flowering stage to first commercial harvest. Under warm conditions may reach harvest in as little time as 50 days, or require as much as 70 days or longer under less favorable environment. Peak of harvest generally 85 to 90 days after transplanting, but varies widely depending on local conditions; in the Southwest, peak may be as late as 110 days after transplanting.

### PLANT

(Pls. 1 and 2)

#### SIZE

Small; at time first fruit ripens, plants typically 40 to 45 cm (16 to 18 inches) high, with maximum spread 120 to 140 cm (4 to 4½ feet) or three times height. Vine growth varies widely, under extremes of climate, from a spread of but 3 feet where climate is cool or dry to 6 feet or more under certain western and southwestern conditions.

#### HABIT

Branches medium decumbent or somewhat sprawling, growth open, fruit exposed, except early in the season and under conditions conducive to excessive leaf growth.

#### BRANCHES

Few, typically 7 to 9; short, 60 to 80 cm (24 to 30 inches) in length; internodes medium length; medium thick, 0.9 to 1.05 cm (⅜ to ½ inch) at bases. In certain southwestern and western regions, internodes long. Main stem small, 1.5 to 2.0 cm (⅝ to ¾ inch) in diameter at base. Under certain conditions in the irrigated Southwest vigorous branches over 7 feet long may be produced.

#### LEAVES

(Pls. 3, B, and 4)

Small; petioles 3 to 4 cm (1¼ to 1½ inches) long, slender; blades 16 to 19 cm (6½ to 7½ inches) long and practically same maximum width. Under semiarid western conditions or under drought conditions leaves are somewhat narrower in proportion to length, 80 to 90 percent of length. Blades somewhat larger, 22 to 23 cm long (about 8¾ to 9 inches), accompany excessive vine growth. Upper surface medium green (23J7 to 24L1),[3] distinctly darker than lower surface (22F6 to 22H6).

Large leaflets usually 7, small percentage of leaves bearing 9, very rarely 5. Small leaflets generally 4 to 6, but under conditions especially favorable for vine growth, as in certain western irrigated regions, may be 10 to 12. Under most conditions leaflets exhibit early tendency to roll or curl inward, showing lighter green color of under sides of leaves and giving characteristic appearance to plant as a whole.

#### FLOWERS

Numerous; commonly 7 to 9 per cluster on first few clusters, while most varieties produce only 4 or 5.

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[3] References are to plate, column, and row: e.g., 23J7 refers to plate 23, column J, row 7 in A Dictionary of Color.

Normally sets 3 or 4 fruits per cluster, but the number varies extremely, depending on soil and climate.

### FRUIT EXTERIOR

(Pls. 5 and 8, A)

*Sepals.*—Numerous, typically 7 to 9; short.

*Immature fruits.*—Large percentage tend to be sharply rounded to round-pointed at stylar end, but as fruits develop the pointedness becomes less pronounced. Pale green, the deep-green color persisting at stem end until nearly ripe. Dark-green narrow streaks radiating from stylar scar are very characteristic.

*Mature fruits.*—Medium size; typically weighing 125 to 155 g (4½ to 5½ ounces). When viewed from either end, appear slightly oblong, measuring 6.5 to 7.0 cm (2½ to 2¾ inches) by 5.8 to 6.3 cm (2¼ to 2⅜ inches), the greater equatorial diameter being approximately 1.1 times the lesser diameter. Depth or polar diameter is 5.0 to 5.4 cm (2 to 2⅛ inches) and is 75 to 78 percent of the greater equatorial diameter. Fruits tend to be slightly proportionally deeper than described in the Northern States and under semiarid and drought conditions; and slightly less deep in the far South and under conditions conducive to excessive vine growth.

Cavity medium, 0.5 to 0.6 cm deep (3/16 to ¼ inch), rather abrupt, smooth. Corky scar tissue about stem attachment is not prominent except under certain semiarid conditions in the Southwest and West. Basin usually absent, stylar end being well rounded or showing slight protuberance at stylar scar. Basin very small and shallow when present. Stylar scar medium size, 0.5 to 0.6 cm (3/16 to ¼ inch) long and 0.3 to 0.4 cm (⅛ to 3/16 inch) wide; not conspicuous nor objectionable. Scar may be 0.7 to 0.9 cm (¼ to ⅜ inch) long under conditions causing excessive vine growth.

Fruit stem separates easily from the fruit, adhering to the plant.

Color scarlet (1J12) with yellowish scarlet near stem end; and lighter, faint, narrow yellow-orange streaks radiating from stylar scar. Skin yellow.

A few shallow circumferential cracks are common; comparatively free from radial cracks.

### FRUIT INTERIOR

(Pls. 5 and 13, A, and Fig. 1)

Outer walls thin, 0.4 to 0.5 cm (3/16 inch); inner walls medium, generally 0.5 to 0.6 cm (3/16 to ¼ inch) in thickness. Cells visible when fruit is cut at equator are numerous, typically 10 to 12, irregular in shape and arrangement, scattered throughout interior with no well-defined solid fleshy central mass. Placentae small. Cells well filled with pulp and seeds; juicy. Seeds few per fruit but medium per unit weight of fruit. Flesh medium firm. Color medium scarlet red tending toward orange (3I12 to 3J11). Core small.

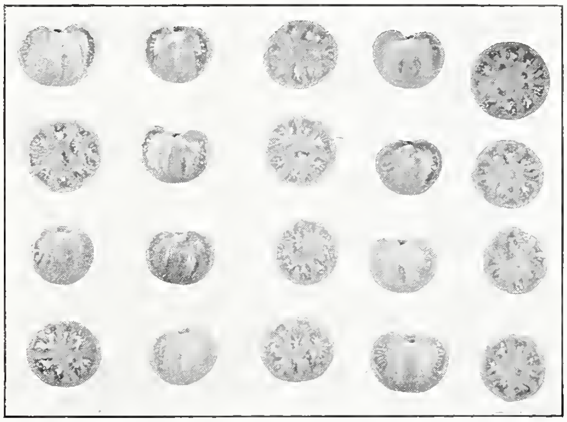


FIGURE 1.—Earliana. Acceptable range of forms of fruit.

### HISTORY

Earliana was introduced in 1900 by the firm of Johnson & Stokes, of Philadelphia. The original stock was produced by George Sparks, of Salem, N.J., and is reported to have been developed from a single plant selection made in a field of tomatoes grown from seed purchased under the name of Stone.

The introducers' early description of the variety was similar to the description given here. For many years between 1900 and 1925, however, the prevailing type of fruit was much more flattened, rougher, thin walled, and distinctly inferior to stocks now available.

## BONNY BEST

### BRIEF CHARACTERIZATION

A home and market garden variety that is adapted to all regions where tomatoes are grown; small acreage grown in the Northeastern States for canning.

Second early; plant and leaves medium size; medium green, branches medium in number, semierect and spreading; fruits slightly shaded.

Ripe fruits deep oblate, medium size, 4½ to 5½ ounces; cross section slightly oblong; greatest diameter 2½ to 2¾ inches: depth about 2⅛ inches, or 77 percent of diameter. Cavity shallow, smooth; corky ring inconspicuous. Basins few, inconspicuous; stylar end well rounded, scar small. Outside color grenadine red with some scarlet; inside color medium scarlet red. Walls medium; cells 6 or 7, regular.

Radial cracks common; circular cracks, rare.

NOTE.—There are numerous stocks and strains of tomato which are practically indistinguishable from Bonny Best but which are grown under different names. Some well-qualified observers consider that the only difference between Bonny Best and John Baer is that John Baer is 2 or 3 days earlier, while others have in mind stocks which they consider typical and which are a few days later than Bonny Best. There is no justification for attempting to draw such fine lines of distinction between so-called varieties because the real existence of such differences is doubtful; and even if they exist, the differences are not great enough to justify individual varietal names for the stocks in question.

Chalk Early Jewel is another so-called variety practically indistinguishable from Bonny Best. It is commonly stated that it is 1 to 3 days later than Bonny Best, and some believe that the plant characters are distinct. The difference in earliness claimed is no more than exists between stocks of a variety and is of little or no importance from the standpoint of nomenclature and description. The supposed difference in plant characters is so slight and so indefinite that it cannot be described or demonstrated satisfactorily and is therefore considered negligible.

For all practical purposes, a good, high-quality stock of Bonny Best will meet all requirements for which the so-called John Baer and Chalk Early Jewel are grown. The differences among the three varieties are almost entirely in the names.

### ADAPTABILITY AND USE

Bonny Best is suited to all regions of the United States where tomatoes can be grown and is very popular in regions of short season. It is grown for canning in New York and other Northern States, but is most important for home and market garden.

### SEASON

Second early; generally 63 to 73 days from transplanting medium-sized plants that have not reached the blossoming stage to first commercial harvest. Rarely as early as 60 days, and under cool or unfavorable conditions may require as many as 80 days. Peak of harvest generally 95 to 100 days after transplanting, but as late as 110 days in regions of cool nights or certain other less favorable growing conditions.

### PLANT

(Pl. 6)

#### SIZE

Medium; at time first fruit ripens, plants typically 45 to 55 cm (18 to 22 inches) in height with maximum spread of 140 to 160 cm (4½ to 5¼ feet) or three times height. Vine growth varies widely under extremes of climate, from a spread of but 3 feet where cool or dry up to 6-foot spread and 26-inch height under certain western and southwestern conditions.

#### HABIT

Semierect and spreading; growth medium dense, fruits moderately shaded but easily visible at time first fruit ripens.

#### BRANCHES

Medium in number, typically 8 to 10; medium in length, 70 to 90 cm (28 to 35 inches); internodes medium length. First few branches medium size, 1.0 to 1.2 cm (⅜ to ½ inch) at bases. Main stem medium, 1.8 to 2.5 cm (¾ to 1 inch) in diameter at base. Under certain conditions in the irrigated Southwest vigorous branches 7 feet long may be produced.

#### LEAVES

(Pls. 3 and 7)

Medium size; petioles 4 to 5 cm (1½ to 2 inches) long; medium in thickness; blades 22 to 26 cm (8½ to

10¼ inches) long, and slightly less in maximum width, 21 to 25 cm (8¼ to 10 inches), except under drought, when leaves are distinctly narrower in proportion to length. In extreme cases width may be but 65 to 75 percent of length. Blades somewhat larger, 26 to 30 cm long (10¼ to 12 inches), may accompany excessive vine growth in certain irrigated areas of the Southwest. Upper surface medium green (23J7 to 24L1), distinctly darker than lower surface (22F6 to 22H6).

Large leaflets usually 7, rarely 9. Small leaflets extremely variable in number depending on location and season, varying from 4 to 10. Leaflets medium size, curling or rolling inward but very little except under drought conditions.

### FLOWERS

Medium number, typically 4 or 5 on first few clusters. Normally sets 2 or 3 fruits per cluster, but the number necessarily varies greatly, depending on soil and climate.

### FRUIT EXTERIOR

(Pls. 9 and 10, A)

*Sepals.*—Medium number, typically 6 or 7, short to medium in length.

*Immature fruits.*—Uniformly pale green except about stem end, which is dark green.

*Mature fruits.*—Medium size; typically weighing 125 to 155 g (4½ to 5½ ounces). When viewed from either end, appears very slightly oblong, measuring 6.5 to 7.0 cm (2½ to 2¾ inches) by 6.0 to 6.5 cm (2¼ to 2½ inches), the greater equatorial diameter being approximately 1.07 times the lesser diameter. Depth or polar diameter is 5.2 to 5.5 cm (about 2⅛ inches) and is 75 to 80 percent of the greater equatorial diameter, except under conditions conducive to excessive vine growth, when the fruits are less deep.

Cavity shallow, 0.3 to 0.4 cm (⅛ to 3/16 inch), sides of cavity smooth and sloping gradually except under conditions of excessive vine growth, when cavity may be slightly deeper and less smooth. Corky scar tissue about stem attachment, inconspicuous except in certain semiarid regions of the West and Southwest. Basins few; small and shallow. Stylar end well rounded, smooth. Stylar scar small, 0.3 to 0.4 cm long (⅛ to 3/16 inch) and 0.15 to 0.20 cm (about ⅛ inch) in width; often a mere dot, quite inconspicuous.

Circumferential cracks are rare, but radial cracks are common.

Fruit stems may or may not adhere firmly to fruit, depending on local conditions.

Color grenadine red, with some scarlet (1H12 with some deeper areas about 1J12), similar to Earliana in plate 8. Skin yellow.

### FRUIT INTERIOR

(Pls. 9 and 13, B, and Fig. 2)

Outer and inner walls medium, typically 0.55 cm (¼ inch), but ranging from 0.5 to 0.6 cm and even to 0.65 cm (3/16 to ¼ inch) in the Southwest and West or in moderately dry seasons. Cells visible when fruit is cut at equator few, typically 6 or 7; fairly regular in shape and arrangement, as segments of a circle. Well-defined, solid, fleshy, central mass. Placentae large; cells well filled with pulp and seeds; flesh medium firm. Medium number of seeds per fruit and per unit weight of fruit. Color medium scarlet red (2K12 to 3K11). Core small.

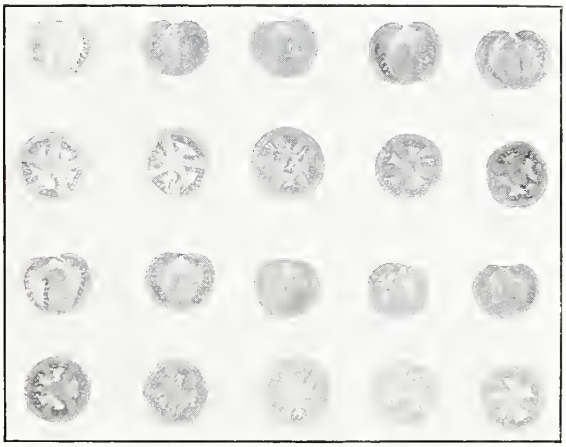


FIGURE 2.—Bonny Best. Acceptable range of forms of fruit.

### HISTORY

Bonny Best was introduced by the firm of Johnson & Stokes, of Philadelphia, in 1908. It was developed from a single plant selection made by George W. Middleton, of Jeffersonville, Pa., in a field of Chalk Early Jewel tomatoes.

Bonny Best has been a consistently satisfactory and important early home and market garden tomato for two decades. There has been no radical change in type during that time.

## GULF STATE MARKET

### BRIEF CHARACTERIZATION

Grown mainly in the Gulf States for shipping in the unripe condition.

Early midseason; plant and leaves medium size, light green; branches numerous, bases sprawling, remainder upright, with tips above main foliage mass of plant; foliage rather open; fruits slightly shaded.

Ripe fruits nearly globular, medium large, 5 to 6 ounces; cross section nearly circular; greatest diameter 2½ to 2⅝ inches, depth 2⅛ to 2⅜ inches, or about 85 percent of diameter. Cavity very shallow, smooth. About half of fruits have small, shallow basins. Stylar end well rounded, scar small. Outside color pale scarlet red when early ripe, and deep brilliant scarlet red to nopal red when fully ripe; inside color scarlet red. Outer walls medium thick; inner walls thick; cells 5 or 6, regular.

Fruit comparatively free from cracking.

### ADAPTABILITY AND USE

Gulf State Market is suited primarily to States touching the Gulf of Mexico, where it is 4 or 5 days earlier than the Globe. It has no marked advantage over the Globe in most of the Central States, but shows a little advantage in earliness in some northern locations. Is grown for home and market garden and for long-distance shipping in the unripe state.

### SEASON

Early midseason; generally 66 to 76 days from transplanting medium-sized plants that have not reached flowering stage to first commercial harvest. Under cool or unfavorable conditions may require 90 days or more. Peak of harvest generally 100 to 105 days after transplanting.

### PLANT

(Pl. 11)

#### SIZE

Medium; at time first fruit ripens, plants typically 50 to 60 cm (20 to 24 inches) in height, with maximum spread of 130 to 150 cm (4½ to 5 feet), or nearly three times the height. Vine growth varies widely under extremes of climate from a spread of but 3 feet where cool or dry up to 6 feet under certain conditions in the West and Southwest.

#### HABIT

Basal portions of lower branches decumbent with terminal portions upright and standing high above main mass of foliage at time first fruit ripens, giving plant the appearance of being somewhat sparse in its growth although the growth is really vigorous. Fruit moderately shaded early in season.

#### BRANCHES

Many; typically 9 or 10; medium long, 90 to 100 cm (3 to 3¼ feet) in length; internodes long, contributing to appearance of sparseness of growth. Branches may be 7 to 8 feet long and of much greater diameter than usual, in certain Western and Southwestern localities. First few branches medium thick, 0.9 to 1.1 cm (⅜ to ½ inch) at bases. Main stem medium, 1.8 to 2.0 cm (⅝ to ¾ inch) in diameter at base.

### LEAVES

(Pl. 3, A)

Medium large; petioles 4 to 5 cm (1½ to 2 inches) long; medium thickness; blades 24 to 28 cm (9½ to 11 inches) long and 21 to 24 cm (8¼ to 9½ inches) maximum width. Leaves slightly larger in certain locations in the West and Southwest. Breadth is consistently less than length and is 80 to 90 percent of length. Upper surface dark yellow-green (22L7), lower surface yellow-green (21I6 to 21J6). Foliage lighter green than that of most other varieties.

Large leaflets 7 to 9, often a large percentage of leaves showing 9. Small leaflets variable in number, ranging from 6 to 8 under dry or cool conditions up to 10 or 11 where vegetative growth is very vigorous. Pedicels long, giving sparse appearance to leaf as a whole.

### FLOWERS

Medium number; typically 4 or 5 on each of first few clusters. Normally sets 2 or 3 fruits per cluster, but the number varies widely, depending on soil and climate.

### FRUIT EXTERIOR

(Pls. 10, B, and 12)

*Sepals.*—Medium in number, typically 6; long and large, especially under conditions conducive to heavy vegetative growth.

*Immature fruits.*—Large percentage tend to be elongate while small, especially under certain western-irrigation conditions. As fruits develop elongation becomes less pronounced. Pale green, with darker green color about stem disappearing a considerable time before ripening of fruit.

*Mature fruits.*—Medium large; typically 140 to 170 g (5 to 6 ounces) in weight. When viewed from either end, practically circular, very slightly angular; greater equatorial diameter measuring 6.5 to 6.7 cm (2½ to 2⅝ inches), which is about 1.05 times the lesser diameter. Depth or polar diameter is 5.5 to 6.0 cm (2⅛ to 2⅜ inches), which is 83 to 88 percent of greater equatorial diameter. Under conditions of excessive vine growth, as in southern Texas, polar diameter may be but 75 to 80 percent of greater equatorial diameter. Under certain other western irrigation conditions polar diameter tends to be distinctly greater, as much as 95 to 100 percent of greatest diameter.

Cavity very shallow, 0.2 to 0.3 cm (about ⅒ inch), sides of cavity smooth, very gradually sloping. Circular corky area surrounding attachment of stem generally not prominent. One half to two thirds of fruits possess small, shallow basins, except in the West and Southwest, where only a small proportion show basins. Stylar ends of fruit smooth and well rounded. Stylar scar small, 0.3 to 0.5 cm (⅛ to 3/16 inch) long and half as wide.

Fruit stem rather firmly attached to fruit, usually largely adhering to the fruit when picked.

This variety is usually comparatively free from cracking.

Color a uniform pale scarlet red at first-ripe stage and deep brilliant scarlet red to nopal red (1L10 to 3L10) when fully ripe, same as Globe in plate 8, D. Skin colorless.

### FRUIT INTERIOR

(Pl. 12 and Fig. 3)

Outer walls medium thick, typically about 0.55 cm (about ¼ inch), but ranging from 0.5 to 0.6 cm, rarely 0.60 to 0.65 cm (about 3/16 to ¼ inch). Inner walls thick, about 0.6 cm (¼ inch). Cells visible when fruit is cut at equator few, typically 5 or 6, fairly regular in shape and arrangement, as segments of a circle. Well-defined solid central fleshy mass. Placentae large; cells moderately well filled with pulp and seeds; seeds medium in size and number; flesh firm. Color scarlet red (3K11 to 3L12), similar to Globe in plate 13, C. Core small.

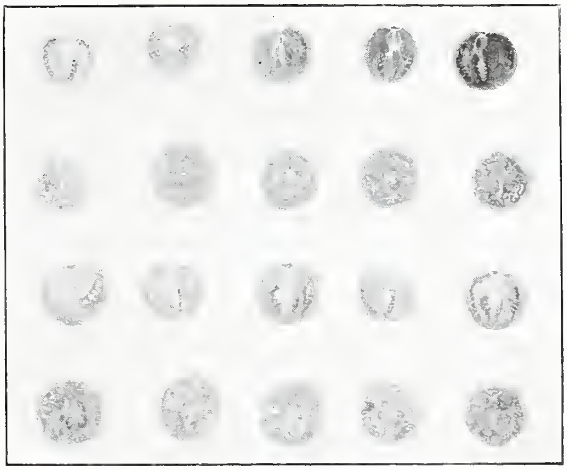


FIGURE 3.—Gulf State Market. Acceptable range of forms of fruit.

### HISTORY

Gulf State Market is a comparatively new variety. It was introduced in 1921 by D. M. Ferry & Co., of Detroit, Mich. The variety is reported as having been developed from a single plant selected from a field of Early Detroit by Walter Richards, of Crystal Springs, Miss., in 1917.

## GLOBE

### BRIEF CHARACTERIZATION

Grown for home and market garden and for shipping in unripe condition.

Midseason; plant and leaves large, light green, internodes long; branches numerous, bases sprawling, remainder upright, with tips above main foliage mass of plant; foliage rather open, fruits slightly shaded.

Ripe fruits nearly globular, medium large, 6 to 7 ounces; cross section nearly circular; greatest diameter 2¾ to 3 inches, depth 2⅜ to 2⅝ inches, or about 88 percent of diameter. Cavity shallow, smooth. About one third of fruits have small, shallow basins. Stylar end well rounded, scar small. Outside color, pale scarlet red when early ripe, and deep, brilliant, scarlet red to nopal red when fully ripe; inside color scarlet red. Walls thick; cells 5 or 6, regular.

Frequently rather susceptible to cracking.

### ADAPTABILITY AND USE

Globe is grown mainly in the South as a shipping tomato, but extensively also in the vicinity of Cleveland and Detroit for the nearby market. It is also grown in many places to a limited extent for home and market garden. Special strains of the variety have been developed for growing extensively in greenhouses.

### SEASON

Midseason; generally 70 to 80 days from transplanting medium-sized plants that have not reached flowering stage to first commercial harvest. Rarely as early as 68 days and under cool or unfavorable conditions requires 90 days or more. Peak of harvest generally 100 to 105 days after transplanting, but may be 120 to 130 days in certain western and southwestern locations.

### PLANT

(Pl. 14)

#### SIZE

Large; at time first fruit ripens, plants typically 50 to 60 cm (20 to 24 inches) tall, with maximum spread of 160 to 180 cm (5¼ to 6 feet) or three times the height. Vine growth varies widely under extremes of climate, from a spread of but 4 feet, where cool or dry, up to 8 feet under certain western conditions.

#### HABIT

Basal portions of lower branches decumbent, with terminal portions upright and standing high above main mass of foliage at time first fruit ripens, giving plant the appearance of being somewhat sparse in its growth, although the growth is really vigorous. Fruit moderately shaded early in season.

#### BRANCHES

Many, typically 9 to 11; long, 100 to 120 cm (3¼ to 4 feet) in length; internodes usually long, contributing to appearance of sparseness of growth. First few branches medium thick, 0.9 to 1.1 cm (⅜ to ½ inch) in diameter at bases. Main stem medium, 1.9 to 2.2 cm (¾ to ⅞ inch) in diameter at base. In certain western and southwestern regions vigorous branches may grow to length of 8 or 8½ feet.

### LEAVES

(Pls. 3, A, 15, and 16, A)

Large; long and broad, but with long petioles and pedicels; leaflets medium size. Petioles 5 to 6 cm (2 to 2½ inches) long, medium thickness. Blades 25 to 30 cm (10 to 12 inches) long and 24 to 28 cm (9½ to 11 inches) maximum width. Blades usually slightly longer than wide, but occasionally slightly broader than long. Semiarid or drought conditions conducive to narrower leaves. Upper surface dark yellow-green (22L7), lower surface yellow-green (21I6 to 21J6). Foliage lighter green than most other varieties.

Large leaflets, 7 or 9, often a large percentage of the leaves showing 9, rarely more. Small leaflets extremely variable in number, ranging from 6 or 8 under dry or cool conditions up to 14 or 16 where vegetative growth is very vigorous. Pedicels long, giving sparse appearance to leaf as a whole.

### FLOWERS

Medium number; typically 4 or 5 on each of first few clusters. Normally sets 2 or 3 fruits per cluster, but this number varies, depending upon soil and climate.

### FRUIT EXTERIOR

(Pls. 8, D, and 17, A)

*Sepals.*—Medium number, typically 6 or 7; very long and large, especially under conditions conducive to heavy vegetative growth.

*Immature fruits.*—Large percentage tend to be somewhat elongate while small, but as fruits develop this elongation becomes less pronounced. Pale green, with darker green color about stem end disappearing a considerable time before ripening of fruit.

*Mature fruits.*—Medium large; typically weighing 170 to 200 g (6 to 7 ounces), except under certain rigorous southwestern and western conditions, where they tend to weigh 140 to 170 g (5 to 6 ounces). When viewed from either end, the fruit appears practically circular, measuring 7.0 to 7.5 cm ($2\frac{3}{4}$ to 3 inches) by 6.7 to 7.1 cm ($2\frac{5}{8}$ to $2\frac{3}{4}$ inches), the greater equatorial diameter being about 1.05 times the lesser diameter. Appears spherical but depth or polar diameter of 6.0 to 6.5 cm ($2\frac{3}{8}$ to $2\frac{5}{8}$ inches) is only 85 to 90 percent of greatest diameter. Conditions causing excessive plant growth may result in fruits being distinctly less deep, the polar diameter being only 80 to 85 percent of greater equatorial diameter.

Cavity shallow, 0.3 to 0.4 cm ($\frac{1}{8}$ to $\frac{3}{16}$ inch) deep, sides of cavity smooth, very gradually sloping. Corky scar tissue about stem attachment not prominent. One half to two thirds of fruits without basins; stylar ends of fruit smooth and well rounded. Basins when present are small and shallow. Stylar scar small, 0.3 to 0.5 cm ($\frac{1}{8}$ to $\frac{3}{16}$ inch) long and half as wide.

Fruit stem may or may not adhere firmly to fruit, depending upon local conditions.

Frequently rather susceptible to cracking.

Color a uniform pale scarlet red at first ripe stage and deep brilliant scarlet red to nopal red (1L10 to 3L10) when fully ripe. Skin colorless.

### FRUIT INTERIOR

(Pls. 13, C, and 17, A, and Fig. 4)

Outer and inner walls thick, typically about 0.60 cm ($\frac{1}{4}$ inch) but varying from 0.55 to 0.65 cm. Cells visible when fruit is cut at equator few, typically 5 or 6, fairly regular in shape and arrangement, as segments of a circle. Well-defined solid central fleshy mass. Placentae large; cells well filled with pulp and seeds; seeds small and few; flesh firm. Color scarlet red (3G11 to 3J12). Core small.

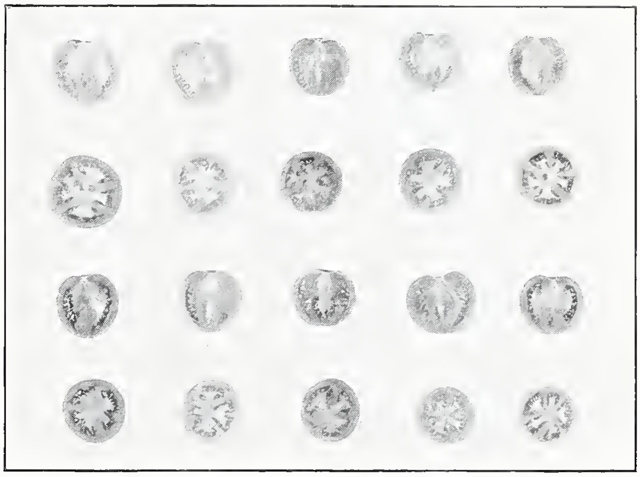


FIGURE 4.—Globe. Acceptable range of forms of fruit.

### HISTORY

Globe was introduced as Livingston's Globe in 1905 by the Livingston Seed Co., of Columbus, Ohio. It is reported to have been selected from a cross between Stone and Ponderosa which was made about 1899 by Robert Livingston, of the above-named firm. The originators have stated that for many years some of the characteristic Ponderosa roughness persisted in the Globe and that only gradually was the present form developed.

## MARGLOBE

### BRIEF CHARACTERIZATION

An all-purpose tomato for home and market garden, canning, and shipping in the unripe condition, particularly in the East and South; is resistant to wilt but not immune.

Midseason; plant and leaves large, medium green; branches numerous, semierect; foliage dense, fruits well shaded.

Ripe fruits nearly globular, medium large, 6 to 7 ounces; cross section nearly circular; greatest diameter 2¾ to 3 inches, depth 2⅝ to 2¾ inches, or about 87 percent of diameter. Cavity broad, very shallow; corky ring conspicuous. About one third of fruits have small shallow basins. Stylar end well rounded, scar medium. Outside color as usually harvested grenadine red to scarlet; slightly darker tending toward English red when fully ripe. Inner color scarlet red plus a little yellow; when fully ripe is scarlet red. Outer walls thick, inner walls very thick; cells 6 or 7, usually irregular.

Reported seriously susceptible to radial cracking in some southwestern, middlewestern, and northeastern localities; generally not very susceptible.

### ADAPTABILITY AND USE

The Marglobe is of especial value in Florida, Mexico, and other far-southern shipping regions; also is a leading canning variety east of the Rocky Mountains, particularly in the Atlantic Coast States; is resistant to Fusarium wilt and to nailhead rust but not immune to these diseases; is the most generally grown of the wilt-resistant varieties; for home and market garden, canning, and shipping in the unripe stage.

### SEASON

Midseason; generally 70 to 80 days from transplanting medium-sized plants that have not reached flowering stage to first commercial harvest. Under warm and favorable conditions may reach harvest in 67 to 68 days, and under cool conditions in 90 days or more. Peak of harvest usually 100 to 110 days after transplanting, but 120 days or more in western and southwestern locations.

### PLANT

(Pl. 18)

#### SIZE

Large; at time first fruit ripens, plants typically 55 to 60 cm (22 to 24 inches) tall, with maximum spread of 160 to 180 cm (5¼ to 6 feet), or three times the height. Under certain conditions in the Southwest it may spread but 4 to 5 feet, and when planted closely in the row may be as tall as 26 to 28 inches. Vine growth varies widely under extremes of climate from a spread of but 4 feet where cool or dry up to 8 feet under certain other conditions.

#### HABIT

Basal parts of branches decumbent but greater portions of branches semierect to erect, giving plant as a whole an appearance of erectness at time first fruit ripens. Foliage dense, fruit largely hidden.

#### BRANCHES

Many; typically 9 to 11; medium long, 90 to 100 cm (3 to 3¼ feet); internodes of medium length. In certain western and southwestern locations vigorous branches 6½ to 7 feet long may be produced. First few branches thick, 1.0 to 1.2 cm (⅜ to ⅝ inch) in diameter at bases. Main stem medium, 1.9 to 2.2 cm (¾ to ⅞ inch) in diameter at base.

#### LEAVES

(Pls. 3, B; 16, B; and 19)

Large; long and broad; petioles long but thick, pedicels of medium length, thick; leaflets large. Petioles 5 to 6 cm (2 to 2½ inches) long. Blades 25 to 30 cm (10 to 12 inches) long. Blades usually slightly longer than wide but occasionally slightly broader than long. Semiarid or drought conditions conducive to narrower leaves. Upper surface medium dark green (23J3 to 24L3), lower surface dark yellow-green (21J6 to 22H6).

Large leaflets, 7 or more often 9. Small leaflets extremely variable in number, ranging from 6 or 8 underdry or cool conditions up to 12 or 14 where vegetative growth is very vigorous.

#### FLOWERS

Medium number, typically 4 or 5 on each of first few clusters. Normally sets 3 or 4 fruits per cluster (about 1 fruit more than most common varieties except Earliana), but the number varies, depending on soil and climate.

### FRUIT EXTERIOR

(Pls. 8, C, and 17, B)

*Sepals.*—Medium number, typically 6; long and large, especially under conditions conducive to heavy vegetative growth.

*Immature fruits.*—Spherical. Pale green; darker green color about stem end disappearing well before ripening of fruit.

*Mature fruits.*—Medium large; typically weighing 170 to 200 g (6 to 7 ounces). Because of tendency to set more fruits under many conditions than do certain other varieties, size may be somewhat smaller than comparable varieties if soil fertility or moisture supply or other factors are unfavorable. When viewed from either end, practically circular, measuring 7.0 to 7.5 cm (2¾ to 3 inches) by 6.7 to 7.0 (approximately 2⅝ to 2¾ inches), the greater equatorial diameter being about 1.06 times the lesser diameter. Appears spherical in shape, but depth or polar diameter of 6.0 to 6.5 cm (2⅜ to 2⅝ inches) is only 85 to 90 percent of greatest diameter. Semiarid or drought conditions cause fruit to be slightly deeper proportionally; when vine growth is excessively vigorous, fruits may be a little less deep, polar diameter being only 80 to 85 percent of greater equatorial diameter.

Cavity of medium depth, 0.3 to 0.5 cm (¼ to 3/16 inch), sides gradually sloping; often broad, very shallow, slight creases or depressions radiating from stem. Point of attachment of stem surrounded by somewhat broad circular corky area 2.0 to 2.5 cm (¾ to 1 inch) in diameter. One half to two thirds of fruits without basins, stylar ends of fruits smooth and well rounded. Basin when present, small and shallow. Stylar scar 0.4 to 0.6 cm (3/16 to ¼ inch) long and half as wide. In certain middle-western, northeastern, and southwestern localities reported to crack objectionably by radial cracks from the stem.

Fruit stem may or may not adhere firmly to fruit, depending upon local conditions.

Color as usually harvested, grenadine red or scarlet (1H12 to 1J12); slightly darker than grenadine red or scarlet tending a little toward English red (4I12 or 4L12), when fully ripe. Skin yellow.

### FRUIT INTERIOR

(Pls. 13, D, and 17, B, and Fig. 5)

Outer walls thick, typically 0.60 to 0.65 cm (about ¼ inch) and inner walls very thick, 0.7 to 1.0 cm (¼ to ⅜ inch). Cells visible when fruit is cut at equator few, typically 6 or 7; rather irregular in shape and arrangement. Well-defined solid central fleshy mass; large fleshy placentae. Cells small, well filled with pulp; seeds relatively few, but of medium size and medium weight per fruit; flesh firm. Color scarlet red (3L12) plus a little yellow; when fully ripe, 3F11 to 3L12.

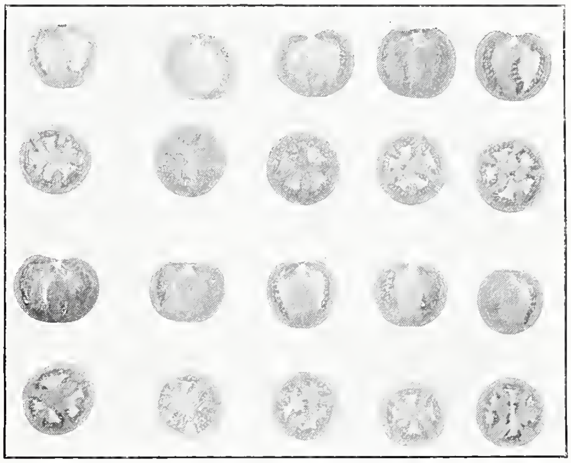


FIGURE 5.—Marglobe. Acceptable range of forms of fruit.

### HISTORY

Marglobe was produced by the United States Department of Agriculture and introduced about 1925. It is the result of a cross between Marvel and Globe made in 1917 by the late F. J. Pritchard. Marvel is a wilt-resistant variety developed by selection from the French variety Merville des Marchés. The other parent, Globe, is described elsewhere on page 12.

## EARLY DETROIT

### BRIEF CHARACTERIZATION

Grown for market garden and for shipping in the unripe condition.

Midseason; plant medium size and leaves medium large, medium green; medium number of branches, semierect and spreading; foliage medium dense, fruit moderately shaded.

Ripe fruits slightly flattened, medium large, 5½ to 6½ ounces; cross section nearly circular but slightly angular; greatest diameter 2¾ to 3 inches; depth 2 to 2½ inches, or about 73 percent of diameter. Cavity medium shallow, smooth. About one third of fruits have broad shallow basins, stylar end very slightly rounded or slightly flattened, scar medium. Outside color pale scarlet red when early ripe and brilliant scarlet red to nopal red when fully ripe; inside color scarlet red. Walls thick, cells 6 or 7, regular.

In general, rather susceptible to cracking.

### ADAPTABILITY AND USE

Suited primarily to States touching the Gulf of Mexico. Too late for best early-market variety to the northward. No advantage over Gulf State Market evident in any location where these studies were made with reference to yield, earliness, or quality. Grown for market garden and for shipping in the unripe state.

### SEASON

Midseason; generally 70 to 80 days from transplanting medium-sized plants that have not reached flowering stage to first commercial harvest, but under cool or unfavorable conditions 90 days or more. Peak of harvest usually 100 to 110 days after transplanting, but 115 days or more in certain western and southwestern locations.

### PLANT

(Pl. 20)

#### SIZE

Medium; at time first fruit ripens, plants typically 50 to 60 cm (20 to 24 inches) tall and with maximum spread of 130 to 150 cm (4¼ to 5 feet), or nearly three times the height. Vine growth varies widely under extremes of climate from a spread of but 3 feet where cool or dry up to 6 feet under certain favorable conditions.

#### HABIT

Semierect and spreading; growth medium dense, fruits moderately shaded but easily visible at time first fruit ripens.

#### BRANCHES

Medium number, typically 9 to 11; medium long, 80 to 100 cm (2½ to 3¼ feet) in length; internodes medium length. Under certain western and southwestern conditions vigorous branches may reach length of 7 feet. First few branches medium thick, 1.0 to 1.2 cm (⅜ to ½ inch) at bases. Main stem medium, 1.8 to 2.0 cm (⅝ to ¾ inch) in diameter at base

#### LEAVES

(Pl. 3, B)

Medium large; petioles 4 to 5 cm (1¼ to 2 inches) long, medium thickness; blades 24 to 28 cm (9½ to 11 inches) long and 20 to 24 cm (8 to 9½ inches) maximum width. Under certain conditions in the Southwest blades may be 12 to 13 inches long, exceeding size of all other varieties described in this publication. Width consistently less than length, usually being 75 to 85 percent of length. Upper surface medium green (23J3 to 24L3), distinctly darker than lower surface (21J6 to 22H6).

Large leaflets 7 or 9. Small leaflets typically few, varying from 5 or 6 under dry and cool conditions up to 8 or 9 where vegetative growth is vigorous.

#### FLOWERS

Medium number; typically 4 or 5 on each of first few clusters. Normally sets 2 or 3 fruits per cluster, but the number varies with the climate.

#### FRUIT EXTERIOR

(Pls. 10, C, and 21)

*Sepals.*—Medium number, usually 6, less often 7; long; and medium width.

*Immature fruits.*—Pale green, with darker green color about stem end disappearing a considerable time before ripening of fruit.

*Mature fruits.*—Medium large; typically 155 to 185 g (5½ to 6½ ounces). When viewed from either end, practically circular but slightly angular; measuring 7.0 to 7.5 cm (2¾ to 3 inches) by 6.7 to 7.1 cm (2⅝ to 2¾ inches) with the greater equatorial diameter about 1.05 times the lesser diameter. When viewed from side of fruit, stylar end somewhat flattened or very slightly rounded. Depth or polar diameter is 5.4 to 5.8 cm (2 to 2½ inches), and is 75 to 80 percent of greater equatorial diameter. Under conditions of excessive plant growth, depth may be only 70 to 75 percent of greater equatorial diameter.

Cavity medium shallow, 0.4 to 0.5 cm (about ¼ inch), sides of cavity smooth, gradually sloping. Circular corky area surrounding attachment of stem, of medium size, 1.5 to 2.0 cm (½ to ¾ inch) in diameter. About one fourth to one half the fruits possess medium broad, shallow basins. Stylar scar medium, 0.6 to 1.0 cm (¼ to ⅜ inch) long, and a third as wide.

In general rather susceptible to cracking.

Fruit stem may or may not separate easily from fruit, depending on local conditions.

Color a uniform pale scarlet red at first-ripe stage and brilliant scarlet red to nopal red (3I10 to 3E11) when fully ripe, similar to Globe in plate 8, D. Skin colorless.

### FRUIT INTERIOR

(Pl. 21 and Fig. 6)

Outer and inner walls thick, typically about 0.60 cm (¼ inch), but varying from 0.55 to 0.65 cm. Cells visible when fruit is cut at equator are few, typically 6 or 7; quite regular in shape and arrangement, as segments of a circle. Solid central fleshy mass well defined and of medium size. Placentae large, cells well filled with pulp and seeds; seeds medium in size and number; flesh firm. Color scarlet red (3G11 to 3J12), practically the same as Globe in plate 13, C.

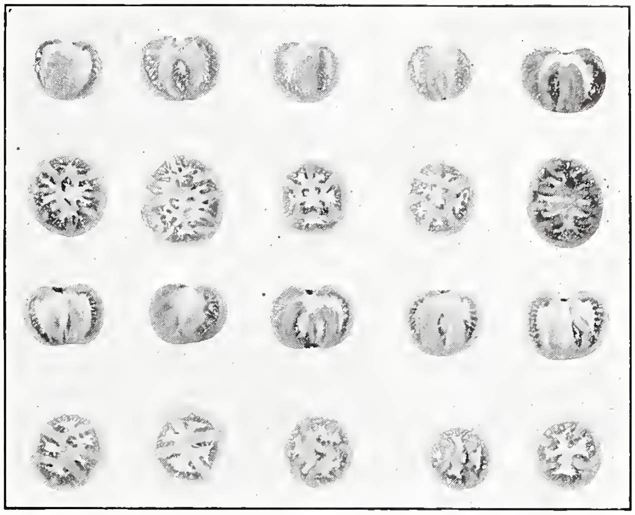


FIGURE 6.—Early Detroit. Acceptable range of forms of fruit.

### HISTORY

The origin of Early Detroit is not entirely clear. It was introduced in 1909 by D. M. Ferry & Co., of Detroit, Mich., who developed it from seeds obtained from a Mr. Rozendahl, of Leavenworth, Kans. How Mr. Rozendahl obtained the original stock is not known.

## GREATER BALTIMORE

### BRIEF CHARACTERIZATION

Grown for canning and to slight extent for home and market garden.

Late midseason; plants large, leaves medium large, medium green; branches very numerous, semierect and spreading; foliage medium dense, fruits moderately shaded.

Ripe fruits distinctly flattened, medium large, 6 to 7 ounces, cross section oblong, greatest diameter 3 to 3⅛ inches, depth 2⅛ to 2¼ inches, or about 71 percent diameter. Cavity oblong, deep, slightly creased. Most fruits have broad relatively deep basins and large coarse stylar scars. Outside color, as usually harvested, grenadine red; when fully ripe, scarlet; inner color scarlet red. Walls medium thick; cells 7 to 9, very irregular.

In general, neither particularly susceptible nor resistant to cracking.

### ADAPTABILITY AND USE

Generally adapted wherever tomatoes are grown except in northernmost States or high altitudes, where only early varieties can produce appreciable yields before frost; also not adapted to certain districts of the Southwest where long-season or late varieties encounter severely hot and dry weather after spring planting, or cold weather after early fall planting before they have had time to bear a good crop. Is one of the two most important canning varieties east of the Rocky Mountains. Grown mainly for canning and to small extent for home and market garden.

### SEASON

Late midseason; generally 73 to 83 days from transplanting medium-sized plants that have not reached flowering stage to first commercial harvest. Under warm and favorable conditions may reach harvest in 68 to 70 days, and under cool conditions may require 90 days or more. Peak of harvest usually 100 to 110 days after transplanting, but often 120 days or more in certain western and southwestern locations.

### PLANT

(Pl. 22)

#### SIZE

Large; at time first fruit ripens plants typically 50 to 60 cm (20 to 24 inches) tall with maximum spread of 160 to 180 cm (5¼ to 6 feet), or three times the height. Vine growth varies widely under extremes of climate from a spread of but 3 feet where cool or dry up to 7 feet under certain western conditions.

#### HABIT

Basal halves of main branches decumbent with distal portions erect and extending slightly above main mass of foliage. Foliage medium dense, fruits moderately shaded early in season.

#### BRANCHES

Very many, typically 10 to 12 and often 13 or 14. Long, 100 to 110 cm (3¼ to 3½ feet); internodes of medium length. In certain western and southwestern locations vigorous branches may reach a length of 6½ to 7 feet. First few branches medium thick, 1.0 to 1.1 cm (about ⅜ inch) in diameter at bases. Main stem large, 2.0 to 2.5 cm (¾ to 1 inch) in diameter at base.

#### LEAVES

(Pls. 3, B; 23; and 24, A)

Medium large; petioles 4.5 to 5.5 cm (about 1½ to 2 inches) long; medium thickness; blades 24 to 28 cm (9½ to 11 inches) maximum width. Blades slightly larger accompany excessively vigorous vine growth. Blades rarely broader than long. Semiarid or drought conditions conducive to narrower leaves. Upper surface medium-dark green (23J3 to 24L3), lower surface dark yellow-green (21J6 to 22H6).

Large leaflets usually 7 or 9. Small leaflets 7 to 9, varying in number but little as compared with some varieties.

#### FLOWERS

Medium number; typically 4 or 5 on each of the first few clusters. Normally sets 2 or 3 fruits per cluster, but the number varies, depending upon soil and climate.

#### FRUIT EXTERIOR

(Pls. 10, D, and 25)

*Sepals.*—Medium number, typically 6; medium length.

*Immature fruits.*—Light green, with darker green color about stem end persisting until fruits are nearly ripe.

*Mature fruits.*—Medium large; typically weighing 170 to 200 g (6 to 7 ounces). When viewed from stem or stylar end, distinctly oblong, measuring 7.5 to 8 cm (3 to 3⅛ inches) by 6.7 to 7.2 cm (about 2⅝ to 2⅞ inches), the greater equatorial diameter being about 1.1 times the lesser diameter. Somewhat less oblong in cross section in southern Texas. When viewed from the side, fruit distinctly flattened; depth or polar diameter 5.3 to 5.7 cm (2⅛ to 2¼ inches) or 70 to 73 percent of greatest diameter. Under conditions of excessive vine growth depth may be only 65 to 70 percent of greater equatorial diameter. Depth varies less than diameter so that under conditions conducive to development of poor size, fruits are somewhat proportionally deeper.

Cavity deep, 0.6 to 0.8 cm (¼ to 5/16 inch); sides very gradually sloping; oblong, with sides of cavity across shorter diameter of fruit lower than across longer diameter. Usually broad, shallow, slight creases or depressions radiating from stem. Circular corky area surrounding attachment of stem, medium size, 1.5 to 2 cm (½ to ¾ inch) in diameter. Practically all fruits exhibit broad and relatively deep basins with large coarse stylar scars 0.8 to 1.2 cm (5/16 to ½ inch) long and half as wide. Certain strains commonly grown in Indiana and other Middle Western States exhibit scars 0.5 to 0.7 cm (3/16 to ½ inch) long and half as wide. Stylar end appears somewhat flattened when fruit is viewed from side.

In general, neither particularly susceptible nor resistant to cracking. Fruit stem may or may not adhere to fruit, depending on local conditions. Color, as usually harvested, grenadine red similar to Marglobe in plate 8, C; when fully ripe, scarlet (1J12). Skin yellow (1H12).

### FRUIT INTERIOR

(Pl. 25 and Fig. 7)

Outer walls and inner walls medium thick, typically 0.55 to 0.60 cm (nearly ¼ inch). Outer walls may be slightly thinner than indicated under unfavorable conditions. Cells visible when fruit is cut at equator, medium number, 7 to 9. Quite irregular in shape and arrangement. No well-defined central fleshy mass. Placentae medium size. Cells large, moderately well filled with pulp; seeds small and moderately numerous; flesh firm. Color scarlet red (3K10), same as Stone in plate 13, E.

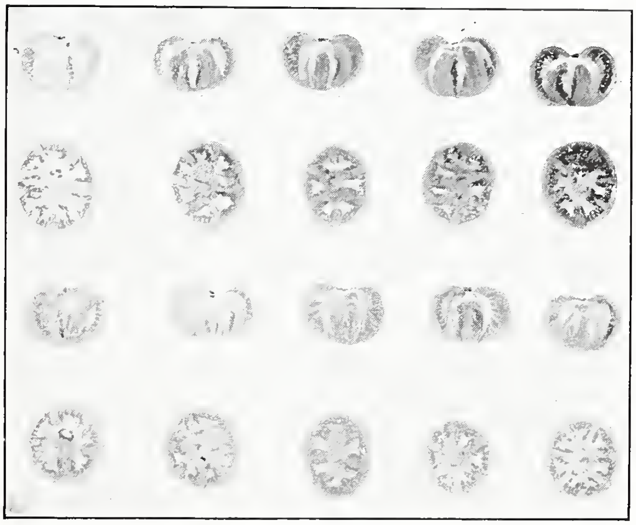


FIGURE 7.—Greater Baltimore. Acceptable range of forms of fruit.

### HISTORY

Greater Baltimore was introduced by J. Bolgiano & Sons, of Baltimore, Md., in 1905. It is reported to have been developed from a single plant selection made about 1900 by John Baer, of Baltimore, in a field of tomatoes grown from seed obtained under the name of Stone.

## STONE

### BRIEF CHARACTERIZATION

Grown for canning and to slight extent for fall shipping in the unripe condition.

Late; plants large, leaves very large, very dark green; branches very numerous, erect early in season; foliage very dense, fruits very well shaded.

Ripe fruits deep, flattened, large, 6½ to 7½ ounces; cross section oblong; greatest diameter 3 to 3⅛ inches, depth 2¼ to 2⅜ inches, or about 77 percent of diameter. Cavity oblong, medium deep, slightly creased. About two thirds of fruits have medium-wide, shallow basins. Stylar end broadly rounded; scar medium to large. Outside color, rich scarlet; inside color, scarlet red. Walls medium thick; cells 7 to 9, very irregular.

In general, not particularly susceptible to cracking.

### ADAPTABILITY AND USE

The Stone tomato is generally adapted wherever tomatoes are grown except in regions where only early varieties have time to produce a good crop before the occurrence of too cold weather, as in the North; in regions where fall planting is practiced; or in regions having too hot and dry weather, as in certain southwestern districts. Is one of the two most important canning varieties east of the Rocky Mountains. Grown mainly for canning and to small extent for fall shipping in the unripe state. Stone is not resistant to wilt.

### SEASON

Late; generally 75 to 90 days from transplanting medium-sized plants that have not reached flowering stage to first commercial harvest. Under warm and favorable conditions may reach harvest in 70 to 72 days, but under cool conditions may require about 100 days, and may be still later in certain localities of the Southwest. Peak of harvest generally 105 to 110 days after transplanting, but is as late as 115 to 120 days in certain regions where first fruit ripens very late.

### PLANT

#### SIZE

(Pl. 26)

Large; at time first fruit ripens plants typically 60 to 70 cm (24 to 28 inches) tall, with maximum spread of 170 to 190 cm (5½ to 6¼ feet), or about 2.75 times the height. Vine growth varies widely under extremes of climate from a spread of but 3 feet where cool or dry up to 7 feet under certain western conditions.

#### HABIT

Distinctly upright in its early growth. Basal parts of main branches decumbent, with greater portions distinctly erect. Foliage very dense, fruits hidden early in season and well shaded until about peak of harvest.

#### BRANCHES

Very many, typically 10 to 12; very long, 110 to 120 cm (3½ to 4 feet); internodes of medium length. In certain districts of the West and Southwest vigorous branches as long as 6½ to 7 feet may be formed. First few branches thick, 1.1 to 1.2 cm in diameter at bases. Main stem large, 2.0 to 2.5 cm (¾ to 1 inch) in diameter at base.

#### LEAVES

(Pls. 3, C; 24, B; and 27)

Very large; long and broad; petioles long but thick; pedicels medium length, thick. Petioles 5 to 6 cm (2 to 2½ inches) long; blades 28 to 32 cm (11 to 12½ inches) long and 24 to 28 cm (9½ to 11 inches) wide.

Size of leaves more constant than in most varieties. Usually distinctly longer than broad. Very dark green in color, darkest of common varieties, upper surface (24E4 to 24L3); lower surface (22J6 to 23J5).

Large leaflets usually 7 or 9, rarely 11. Small leaflets numerous, usually 9 to 11, but varying from 7 or 8 under dry or cool conditions to 15 where vegetative growth is very vigorous.

#### FLOWERS

Medium number, typically 4 or 5 on each of first few clusters. Normally sets 2 or 3 fruits per cluster, but the number differs depending upon soil and climate.

#### FRUIT EXTERIOR

(Pls. 28 and 29, A)

*Sepals.*—Medium in number, typically 6; medium in length.

*Immature fruits.*—Pale green; darker green color about stem end persisting until fruits are nearly ripe.

*Mature fruits.*—Large; typically weighing 195 to 215 g (7 to 7½ ounces). In certain districts of the Southwest fruits generally smaller, 5½ to 6½ ounces. When viewed from either end, distinctly oblong, measuring 7.6 to 8.0 cm (3 to 3⅛ inches) by 6.7 to 7.2

cm (about 2⅝ to 2⅞ inches), the greater equatorial diameter being about 1.1 times the lesser diameter. When viewed from the side, fruit is distinctly flattened, depth or polar diameter being 5.7 to 6.1 cm (2¼ to 2⅜ inches), 75 to 78 percent of greatest diameter. Under conditions of excessive vine growth depth may be only 71 to 73 percent of greater equatorial diameter. Depth varies less than diameter, so that under conditions conducive to poor size and development, fruits are somewhat deeper proportionally.

Cavity medium deep, 0.5 to 0.7 cm (3/16 to ¼ inch), sides very gradually sloping; cavity oblong, with sides of cavity across shorter diameter of fruit lower than across longer diameter. Usually broad, shallow, slight depressions or creases radiating from stem. Point of attachment of stem surrounded by medium-broad circular corky area 1.5 to 2.0 cm (½ to ¾ inch) in diameter.

About half to two thirds of fruits show shallow basins of medium width. Stylar end of fruit broadly rounded. Stylar scar medium to large, 0.6 to 0.9 cm (¼ to ⅜ inch) long and 0.3 to 0.4 cm wide (⅛ to 3/16 inch). Under conditions conducive to excess vine growth stylar scars are longer, 1.0 to 1.5 cm (⅜ to ½ inch).

Fruit stem generally adheres rather firmly to fruit.

Not particularly susceptible nor resistant to cracking. Color, scarlet, a trifle deeper than 1J12, similar to Marglobe in plate 8, C. Skin yellow.

### FRUIT INTERIOR

(Pls. 13, E, and 28, and Fig. 8)

Outer and inner walls medium thick, typically 0.55 to 0.60 cm (about ¼ inch). Cells visible when fruit is cut at equator medium in number, 7 to 9; very irregular in shape and arrangement. No well-defined central fleshy mass. Placentae small to medium size. Cells large, moderately well filled with pulp; seeds medium to large, quite numerous; flesh firm. Color scarlet red (3K10).

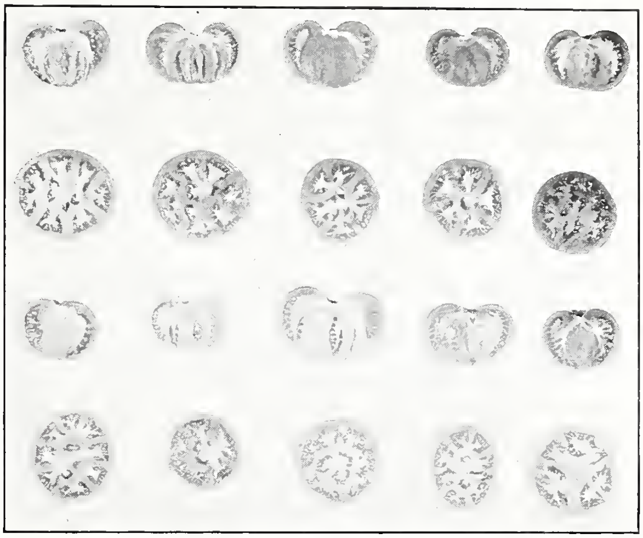


FIGURE 8.—Stone. Acceptable range of forms of fruit.

### HISTORY

The Stone was introduced by the Livingston Seed Co., of Columbus, Ohio, in 1889, under the name of Livingston's Stone. It was developed from a stock of seed of unknown origin which the introducers obtained from a market gardener near Columbus, Ohio, about 1885.

## SANTA CLARA

### BRIEF CHARACTERIZATION

Grown for canning and to a slight extent for home and market garden.

Very late; plants very large, leaves medium size, medium green; branches very numerous, spreading; foliage dense, fruits well shaded.

Immature fruits almost white just before turning red; often dark-green streaks radiate from stylar scar.

Ripe fruits distinctly flattened, very large, 9 to 12 ounces, cross section oblong; greatest diameter 3½ to 4 inches, depth 2⅛ to 2⅜ inches, or about 60 percent of diameter. Cavity deep, abrupt, slightly creased; corky ring conspicuous. Most fruits have wide, very deep basins with slightly irregular surface. Stylar scar very large, coarse, corky. Outside color scarlet, inside color scarlet red. Outer walls thick, inner walls medium thick. Peripheral cells 10 to 14, regular; other cells 10 to 12, irregular.

Comparatively free from cracking where it is well adapted.

### ADAPTABILITY AND USE

Grown in northern and central California chiefly for canning and to a small extent for home and market garden. Requires a long growing season, high temperatures, and a heavy fertile soil. Low humidity does not affect fruit setting adversely. Does not do well east of Rocky Mountains.

### SEASON

Very late; usually 85 to 100 days from transplanting medium-sized plants that have not reached flowering stage to first commercial harvest. Attains peak of harvest about 115 to 125 days after transplanting. Strains either earlier or later, but otherwise practically identical are available.

### PLANT

(Pl. 30)

#### SIZE

Very large; at time first fruit ripens, plants 50 to 60 cm high (20 to 24 inches) and with maximum spread of 180 to 210 cm (6 to 7 feet). On heavy soils with ample water vine growth will be heavier, and under conditions of lower temperature or on poorer sandy soils vine spread may not exceed 5 feet.

#### HABIT

Basal portions of lower branches decumbent with terminal portions upright; foliage dense, fruits well shaded.

#### BRANCHES

Very many, typically 12 to 14, ranging from 10 to 17, and from 160 to 180 cm (5¼ to 6 feet) in length. Internodes of medium length about 6 cm (2⅓ inches). First few branches thick, 1.6 to 1.9 cm (⅝ to ¾ inch) in diameter. Main stem very thick, 3.0 to 3.8 cm (1¼ to 1½ inches) in diameter at the base.

### LEAVES

(Pl. 3, B)

Medium size; leaflets medium size. Petioles 5.8 to 6.4 cm (2¼ to 2½ inches) long, slightly less than medium thick. Blades 28 to 32 cm long (11 to 12½ inches) and 23 to 25 cm (about 9 to 10 inches) wide.

Large leaflets, usually 7. Small leaflets quite variable in number.

### FLOWERS

Few or medium number; usually 4 to 6 on first few clusters. Normally sets 2 or 3 fruits per cluster, often more. Blossoms do not fall easily; all flower parts increased by chorisis.

### FRUIT EXTERIOR

(Pls. 29, B, and 31)

*Sepals.*—Numerous, from 7 to 9; broad and tapering, about 8 times as long as wide, slightly recurved from the fruit surface.

*Immature fruits.*—Pale green, becoming almost white or ivory just before the flesh turns red if ripened in the shade. Often with broad, dark-green lines with irregular margins radiating from the stylar scar.

*Mature fruits.*—Very large, 270 to 350 g (9½ to 12½ ounces) in weight. Individual fruits may weigh over 600 g (21 ounces). Outline from above is slightly oblong, measuring 9.0 to 10.1 cm (3½ to 4 inches) by 8.5 to 9.2 cm (3 5/16 to 3⅝ inches), the greater equatorial diameter being about 1.08 times the lesser diameter. Depth is 5.3 to 6.0 cm (2⅛ to 2⅜ inches), about 60 percent of the greater equatorial diameter.

Cavity deep, about 0.7 cm (about ⅓ inch), sides corrugated slightly, slope abrupt; 4.0 to 4.5 cm (1 7/16 to 1¾ inches) wide. Corky scar surrounding stem is large, tough, well formed. Basins present in about 95 percent of fruits; wide, very deep, 0.5 cm (3/16 inch), and with a slightly irregular surface. Stylar scar long and wide, 1.5 to 2.5 cm (9/16 to 1 inch) long by 0.85 to 1.3 cm (5/16 to ½ inch) wide, tough, and corky. Navels seldom present.

Skin tough; fruits comparatively free from radial or circumferential cracks in regions to which the variety is adapted.

Color, when fully ripe, scarlet (1J12), similar to Marglobe in plate 8, C. Skin yellow.

### FRUIT INTERIOR

(Pl. 31 and Fig. 9)

Outer wall thick, 0.61 to 0.66 cm (about ¼ inch) inner walls slightly thinner, 0.55 to 0.60 cm (about ¼ inch), firm. Fruit contains 10 to 14 seed cells regularly arranged near periphery of fruit, and most fruits contain other cells, abortive or with seeds, irregularly scattered in the fleshy interior, usually 10 to 12, but ranging from 4 to 20. Central mass very large, fleshy, and very firm. Placentae small, seeds few, pulp completely filling cell cavity. Core large, fibrous, colored slightly green near stem scar, white elsewhere. Flesh color scarlet red (3K10), same as Stone in plate 13, E.

### HISTORY

The Santa Clara was developed from the common country tomato grown for manufacture in the Santa Clara Valley since 1890 and known locally as Trophy or Canner. The fruit of this variety was large, irregular, often corrugated, with a rough cavity and an irregular basin, often with a large corky stylar scar with deep navel. This was not the same variety that seedsmen catalogued as Trophy or Improved Trophy.

The variety, as it is now offered to the trade in California, can be traced back to a single plant selection made in 1923 by the Canners League representatives and propagated by the Ferry-Morse Seed Co.

The final development of this new variety was accomplished by F. A. Dixon, of the Canners League; W. H. Nixon, of the Ferry-Morse Seed Co.; B. T. Booye, of the California Packing Corporation; and J. W. Lesley and J. T. Rosa, of the University of California.

Since the new selection was very different from the variously named parent variety, the name Santa Clara has been adopted, originally to describe the selections of the Ferry-Morse Seed Co., but it has since been extended to all strains which resemble these.

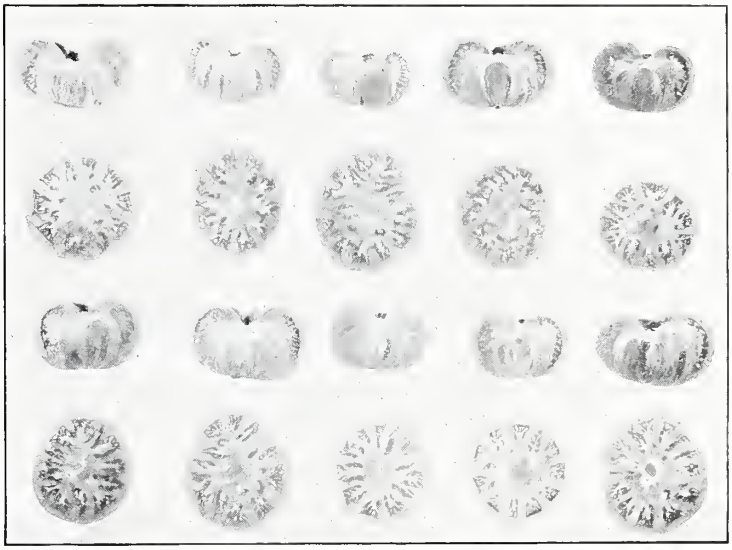
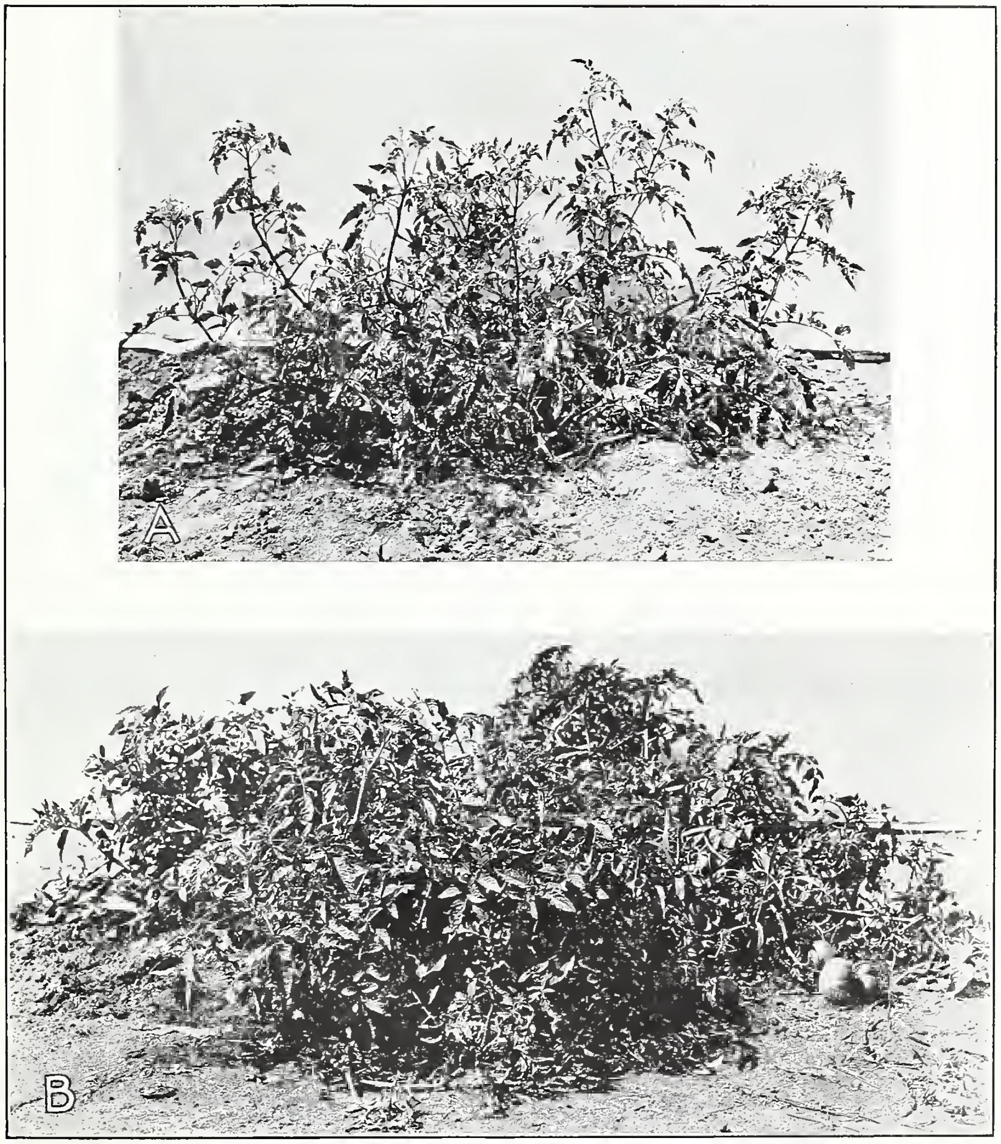
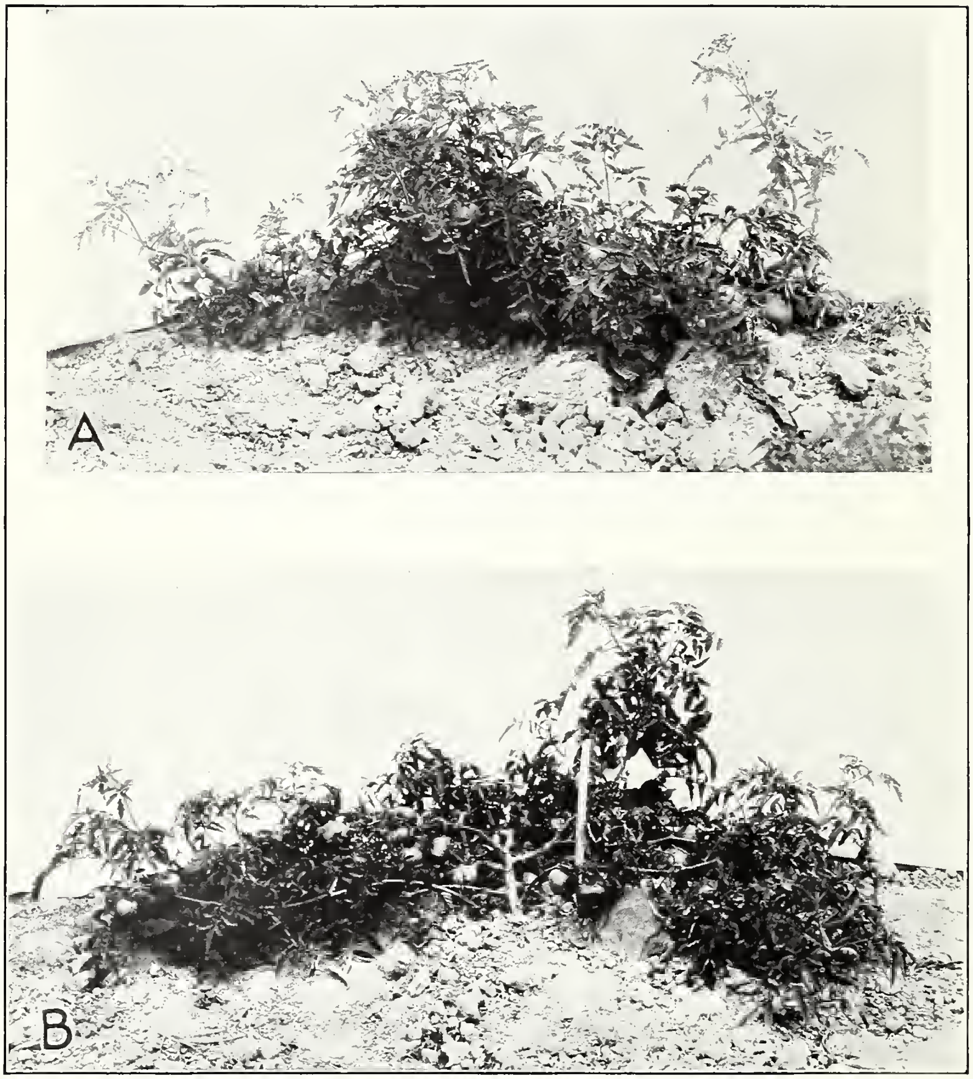


FIGURE 9.—Santa Clara. Acceptable range of forms of fruit.

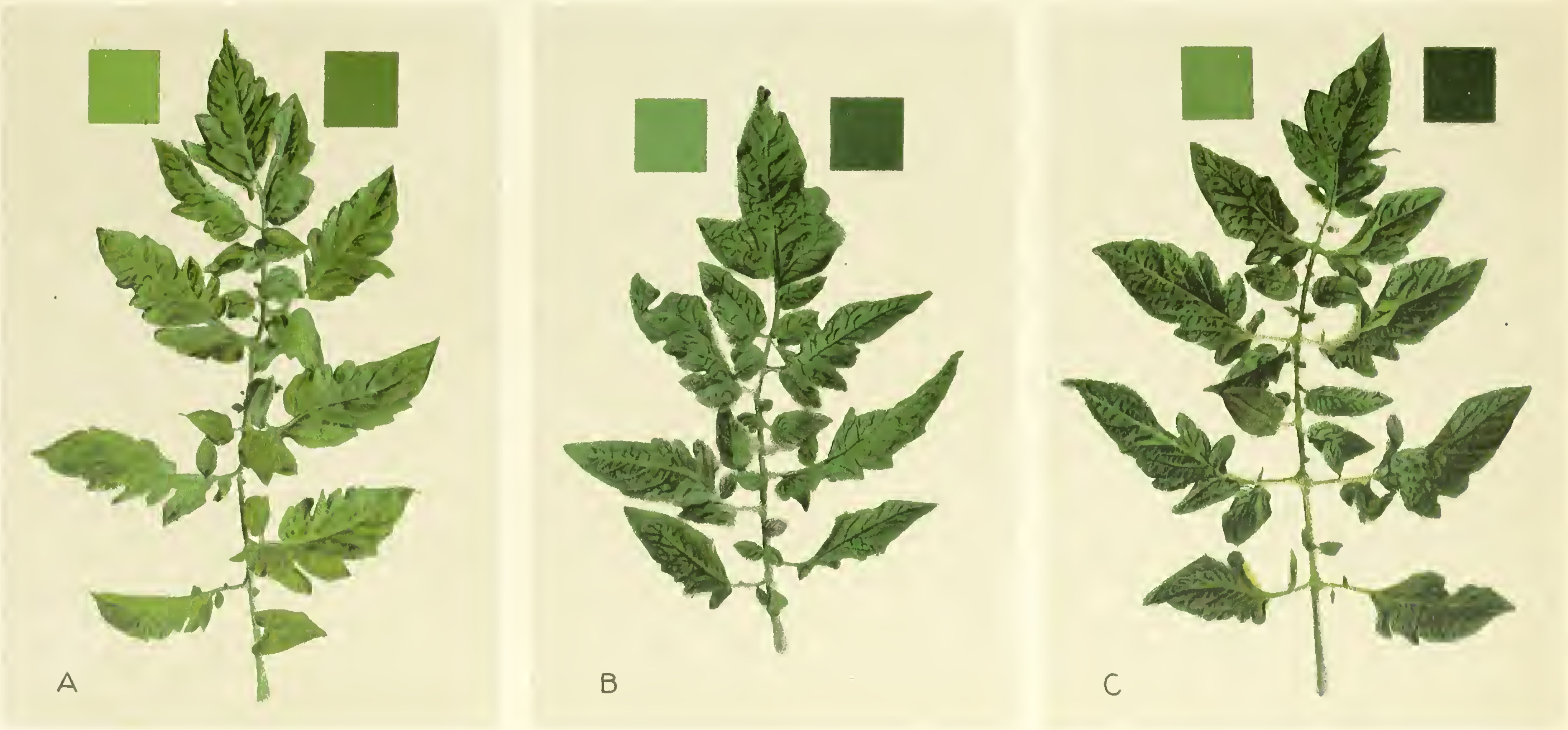
The strains developed by the Ferry-Morse Seed Co. are known as Early Santa Clara and Medium Santa Clara, two strains which are distinct in plant size, leaf color, and fruit structure; and those developed by the California Packing Corporation are known as Early Santa Clara, Medium Santa Clara, and Late Santa Clara. In most particulars the strains developed by these two agencies are practically identical, season for season. The Medium Santa Clara is the type described here as the standard of the variety.



Excellent growth of Earliana: A, At first harvest; B, at peak of harvest.

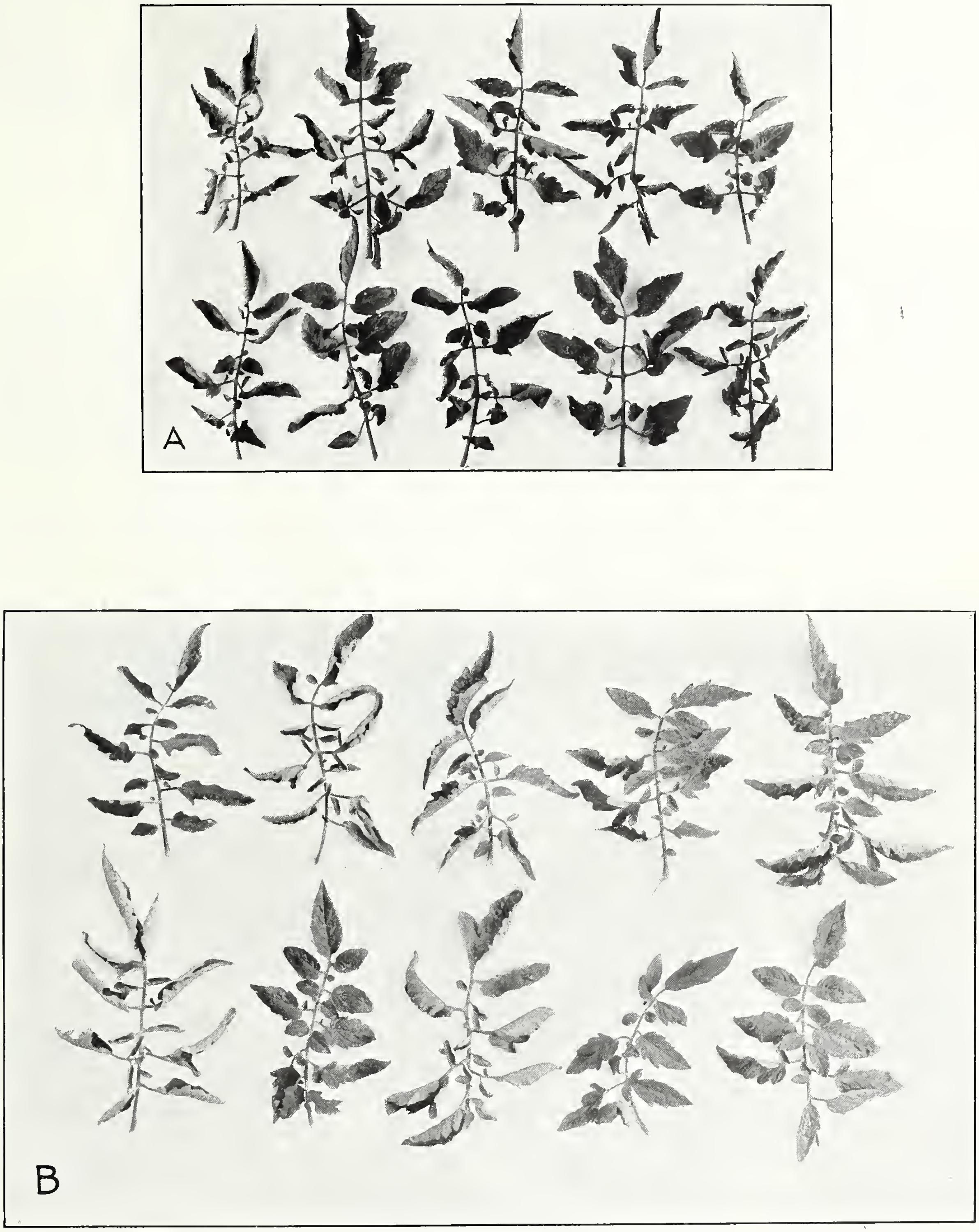


Typical growth of Earliana: A, At first harvest; B, at peak of harvest.

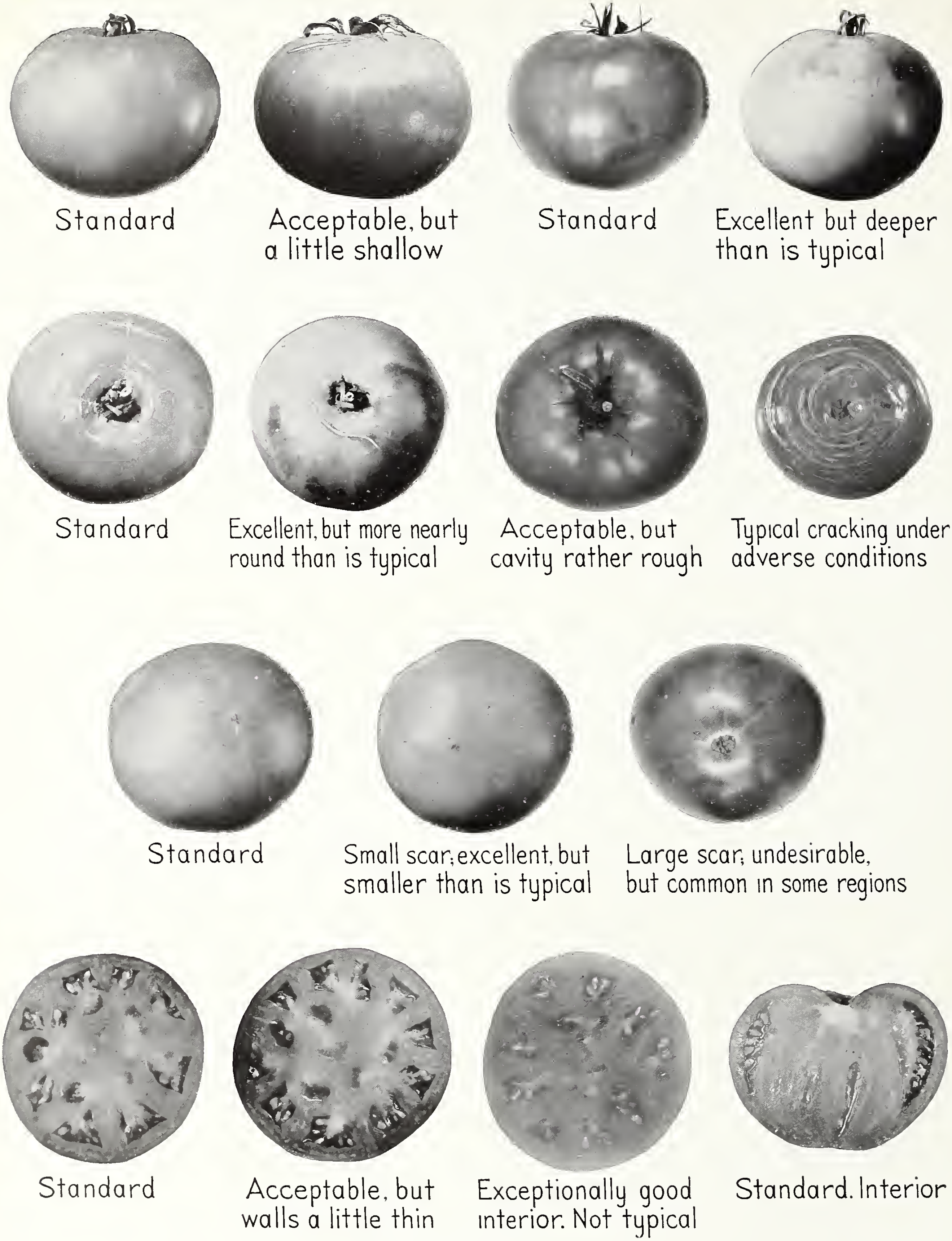


L. C. C. Krieger, Pinx.
Lith. A. Hoen & Co., Inc.

Three types of leaf color: A, Globe and Gulf State Market; B, Earliana, Bonny Best, Early Detroit, Marglobe, Greater Baltimore, and Santa Clara; C, Stone.



Leaves of Earliana are characteristic regardless of location where grown: A, Grown at Washington, D.C., 1929; B, grown at Davis, Calif., 1931. × ⅕.



Standard

Acceptable, but a little shallow

Standard

Excellent but deeper than is typical

Standard

Excellent, but more nearly round than is typical

Acceptable, but cavity rather rough

Typical cracking under adverse conditions

Standard

Small scar; excellent, but smaller than is typical

Large scar; undesirable, but common in some regions

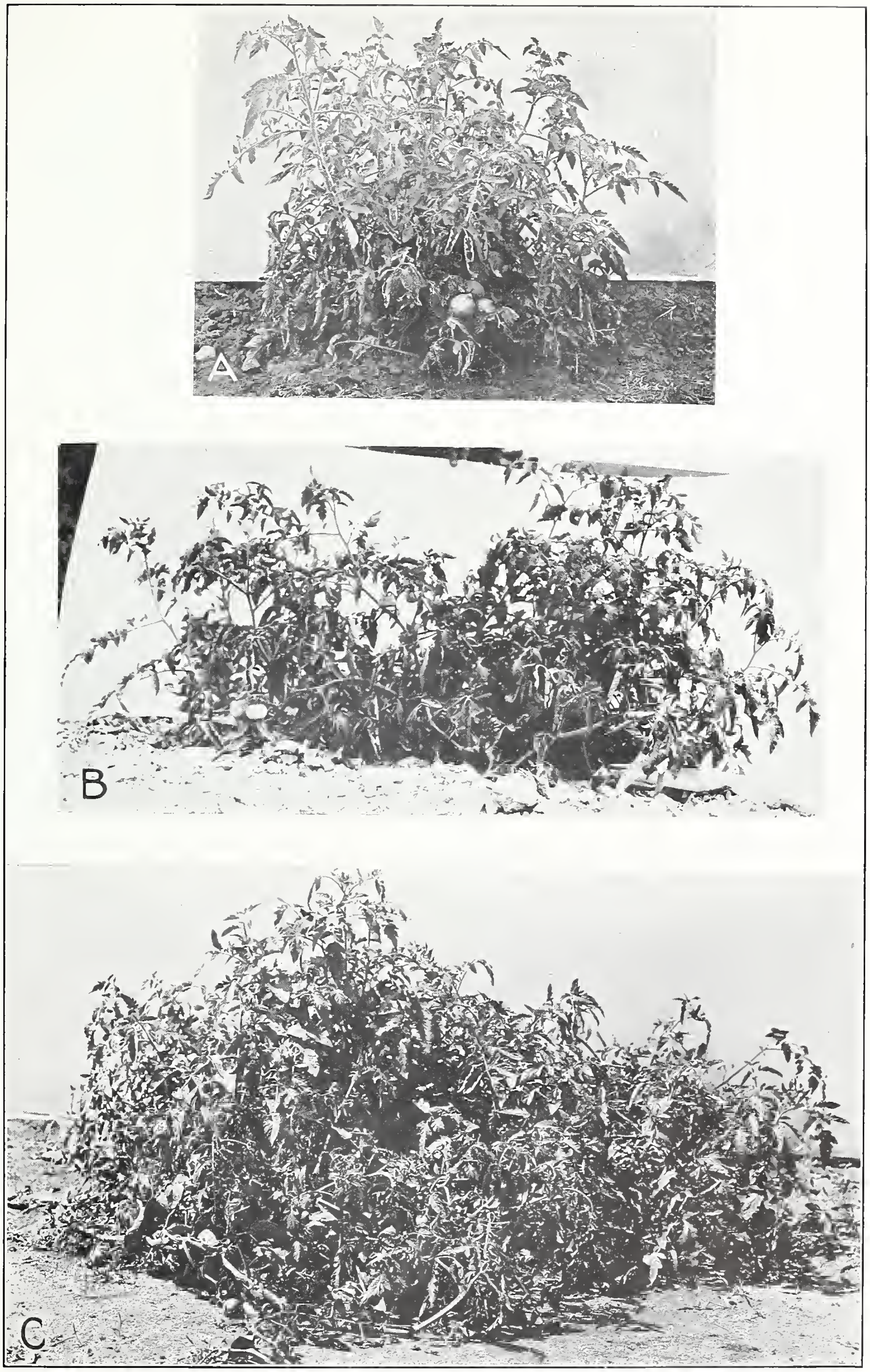
Standard

Acceptable, but walls a little thin

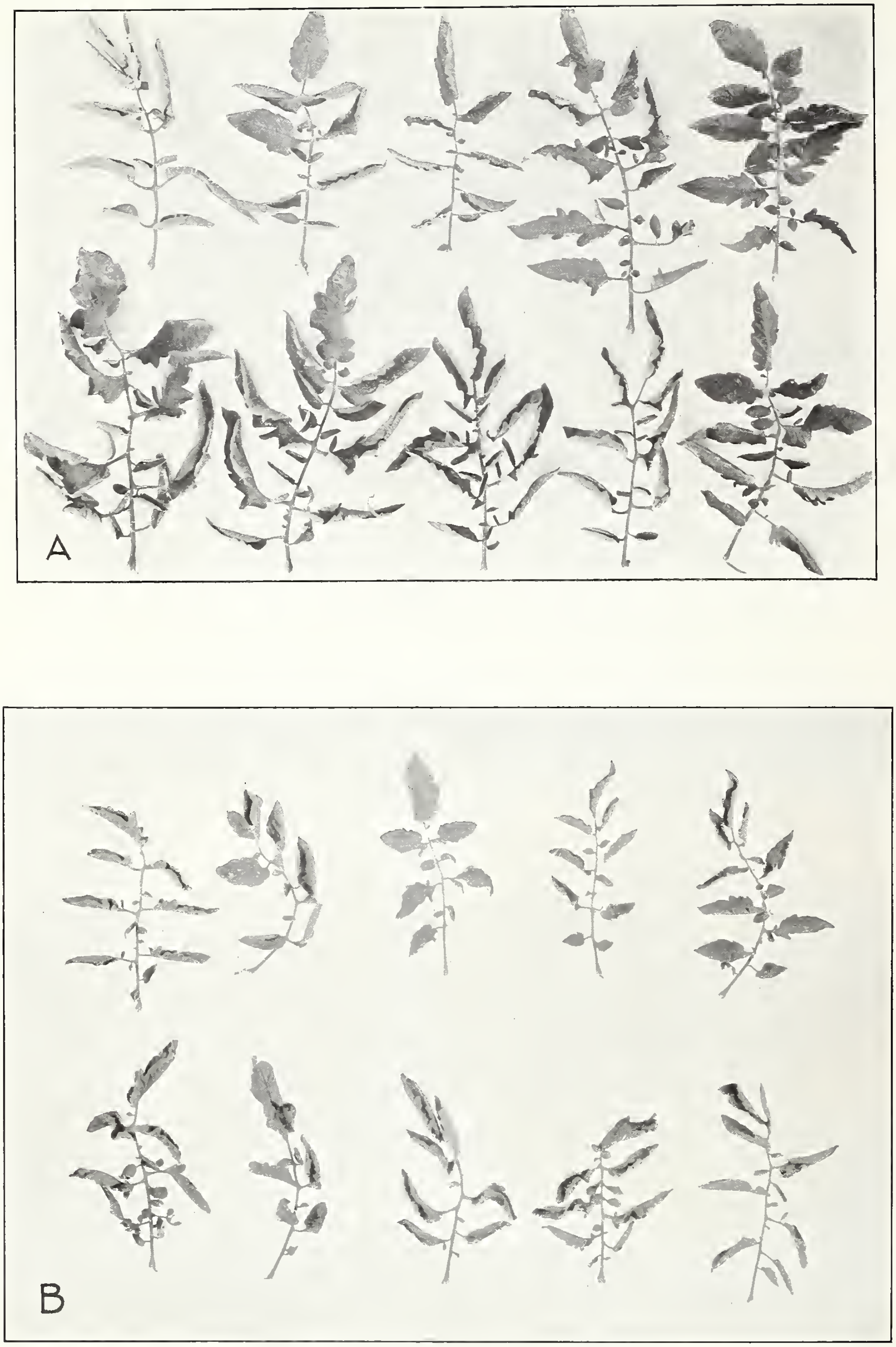
Exceptionally good interior. Not typical

Standard. Interior

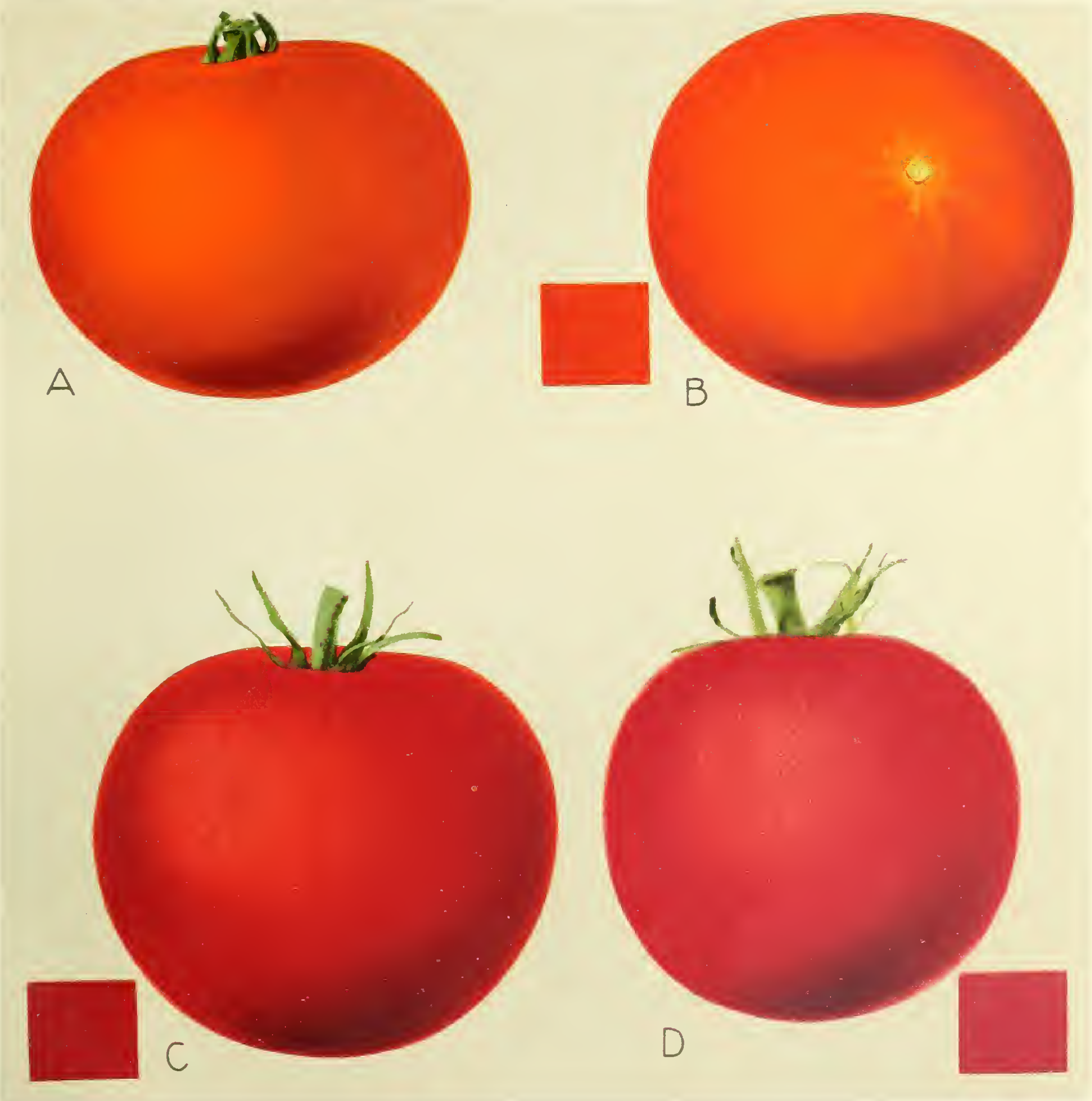
Fruits of Earliana. × ½.



Plants of Bonny Best: A, At first harvest, under favorable conditions; B, at first harvest, weather hot and dry; C, at peak of harvest, growth excellent.



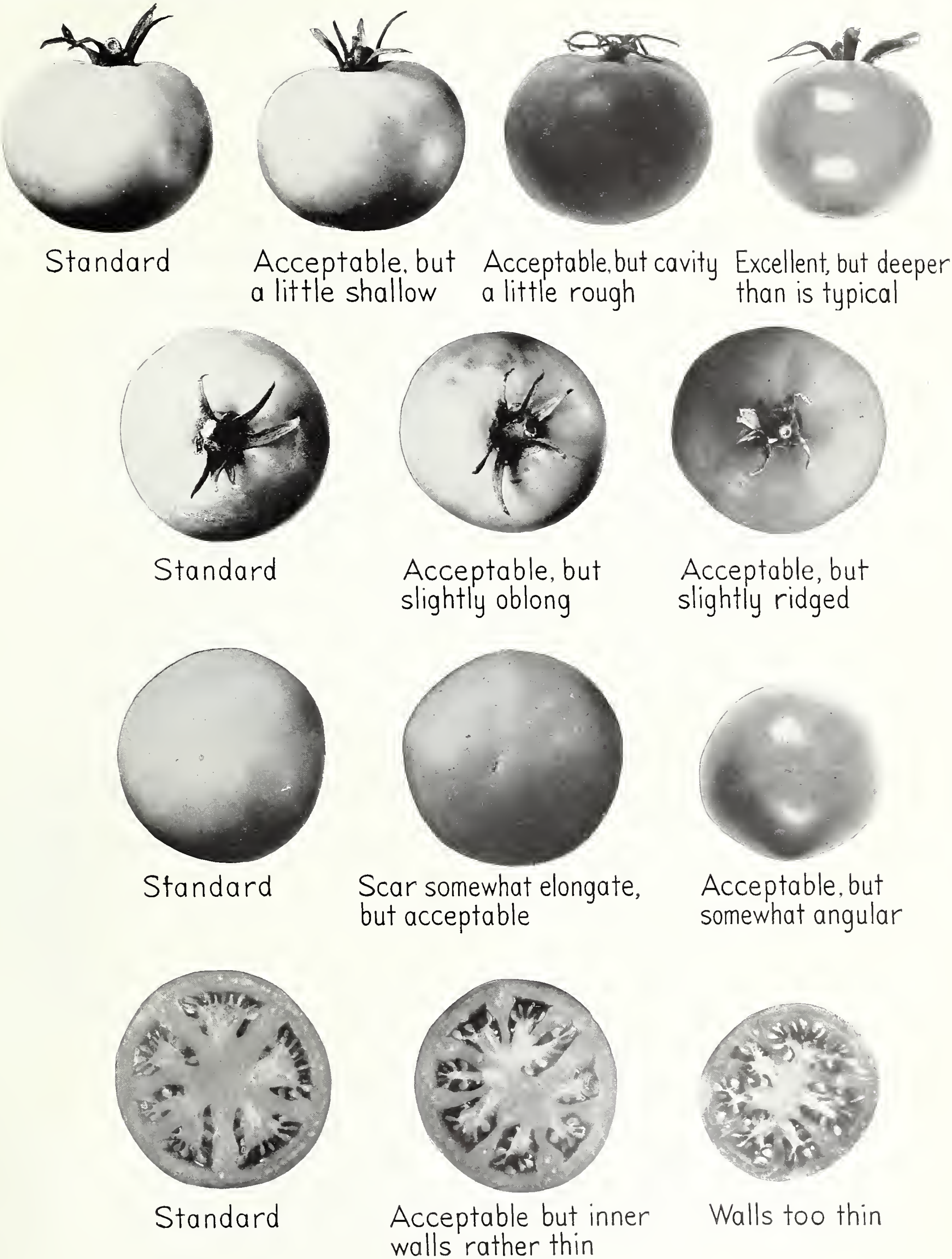
Leaves of Bonny Best showing difference between seasons in one locality: A, Grown at Davis, Calif., 1930; B, grown at Davis, Calif., 1931. × ⅕.



L. C. C. Krieger, Pinx.

Lith. A. Hoen & Co., Inc.

Tomato fruits: A, Earliana, lateral view; B, Earliana, blossom end; C, Marglobe; D, Globe. All natural size.



Standard

Acceptable, but a little shallow

Acceptable, but cavity a little rough

Excellent, but deeper than is typical

Standard

Acceptable, but slightly oblong

Acceptable, but slightly ridged

Standard

Scar somewhat elongate, but acceptable

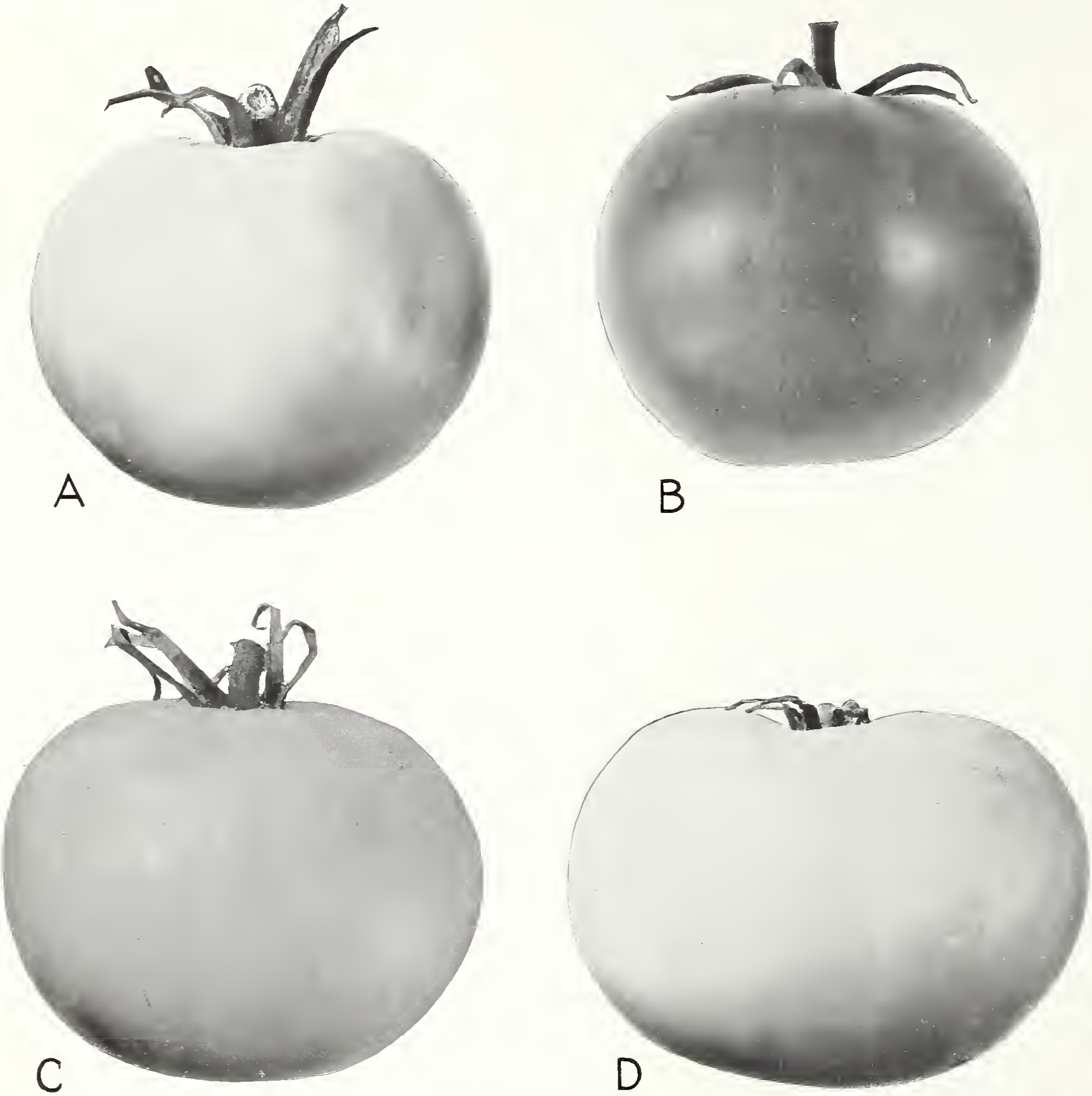
Acceptable, but somewhat angular

Standard

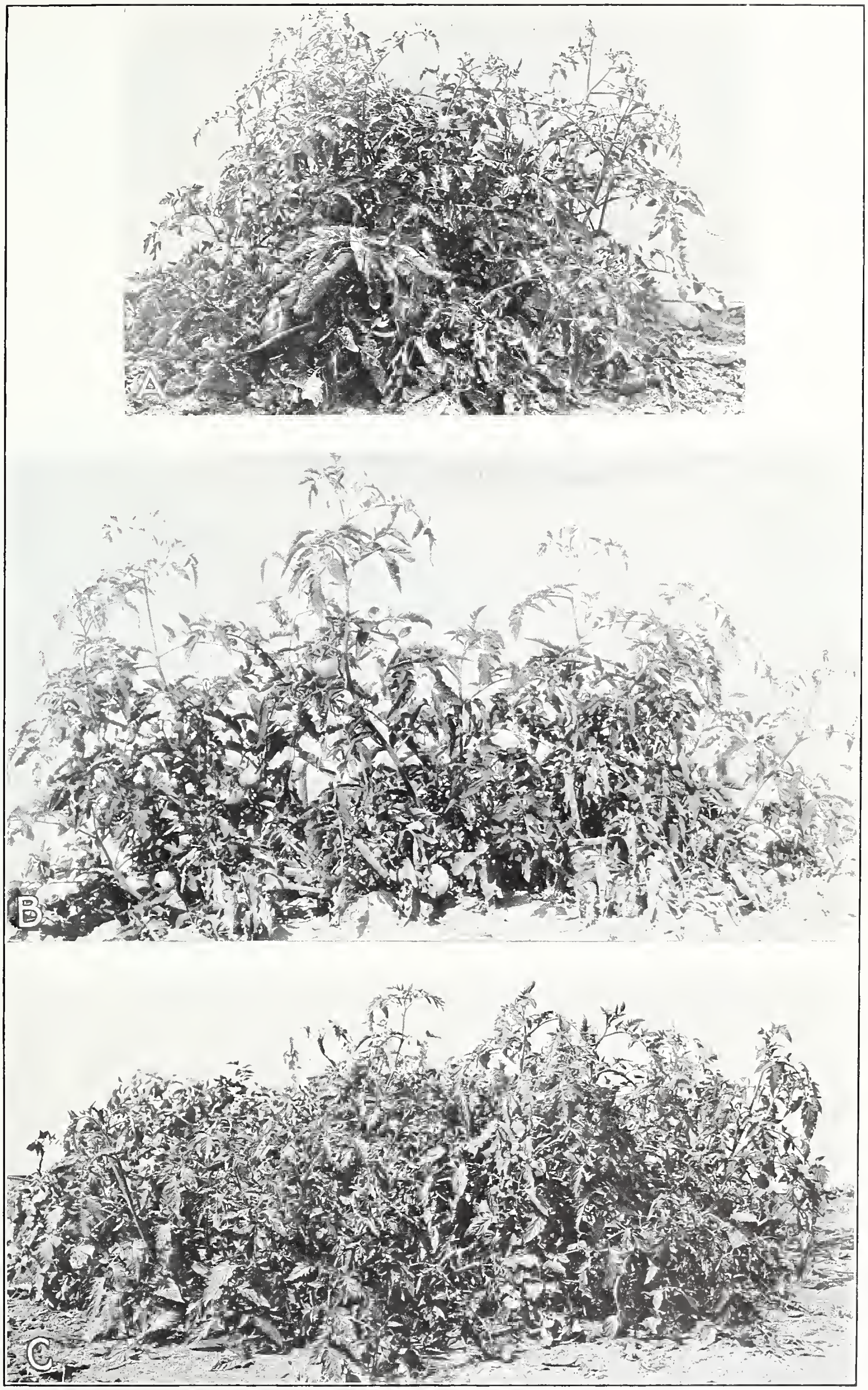
Acceptable but inner walls rather thin

Walls too thin

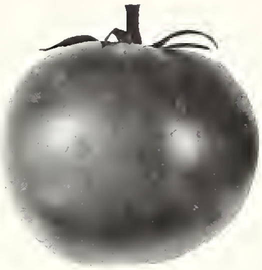
Fruits of Bonny Best. × ½.



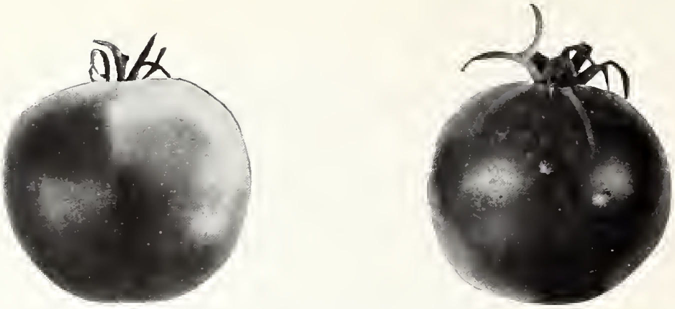
Tomato fruits: A, Bonny Best; B, Gulf State Market; C, Early Detroit; D, Greater Baltimore. All natural size.



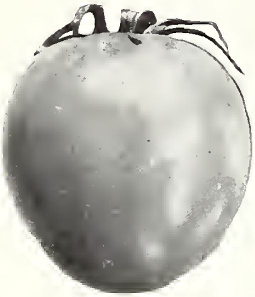
Plants of Gulf State Market: A, At first harvest, excellent growth; B, at first harvest, average growth; C, at peak of harvest, excellent growth.



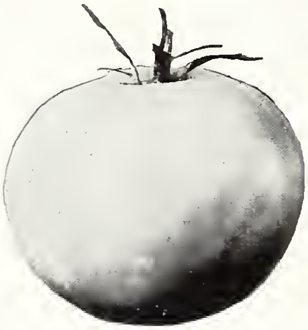
Standard



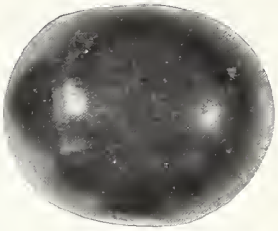
Excellent forms, but deeper than typical fruits under most conditions of growth



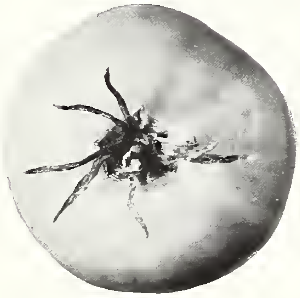
Form sometimes attained in the West and Southwest. Not typical



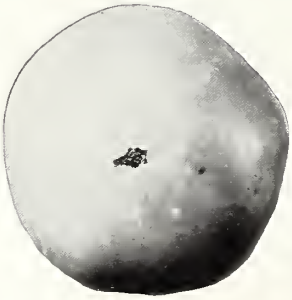
Acceptable, but a little shallow



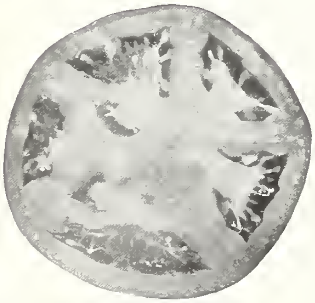
Acceptable, but rather shallow



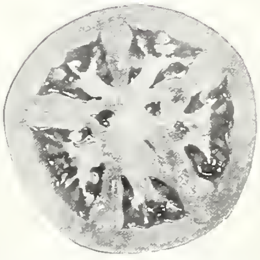
Standard



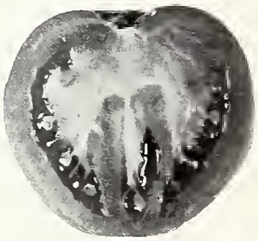
Acceptable, but scar rather large



Standard



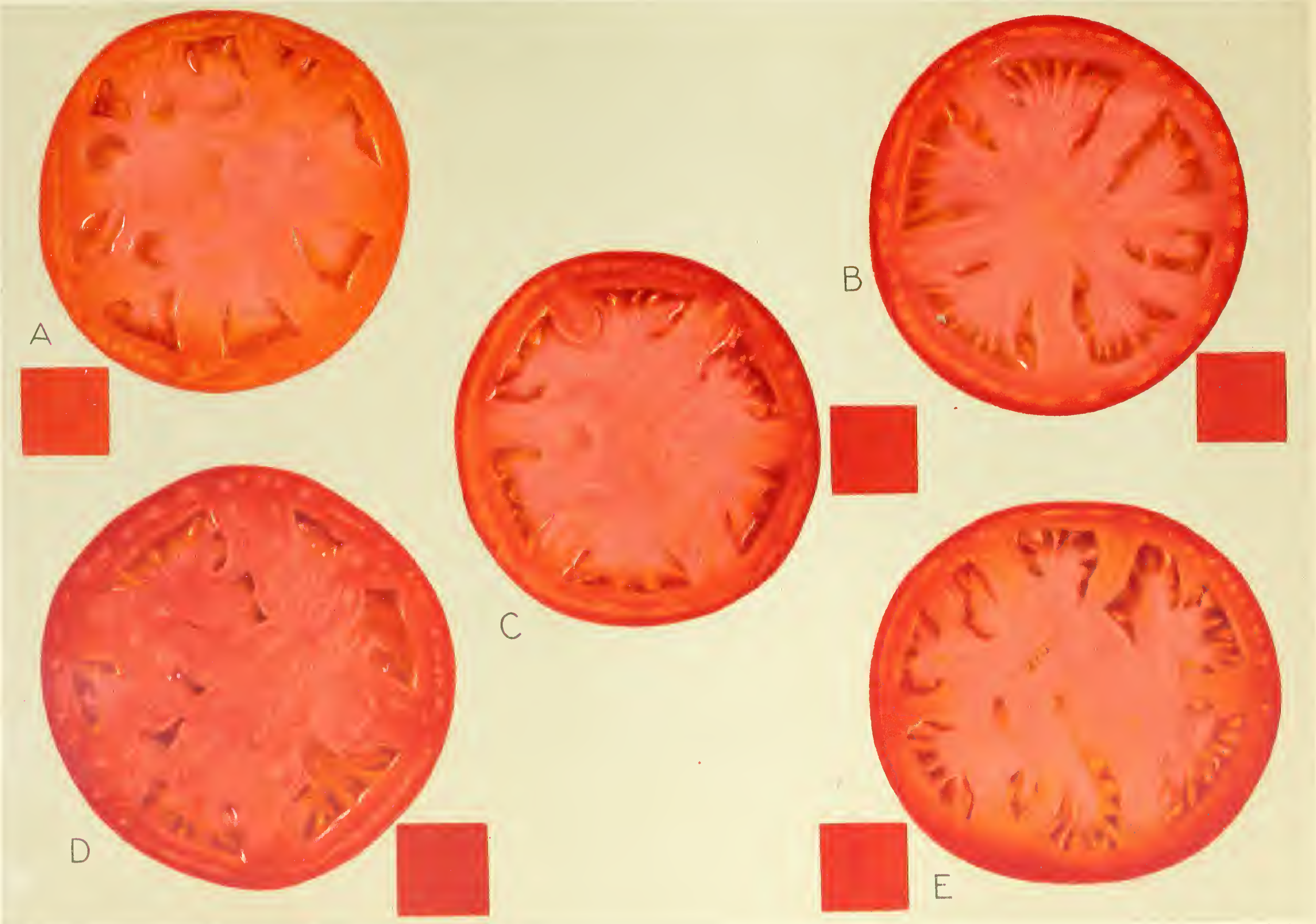
Lacking in interior flesh, but acceptable



Standard Interior

Fruits of Gulf State Market. × ½.

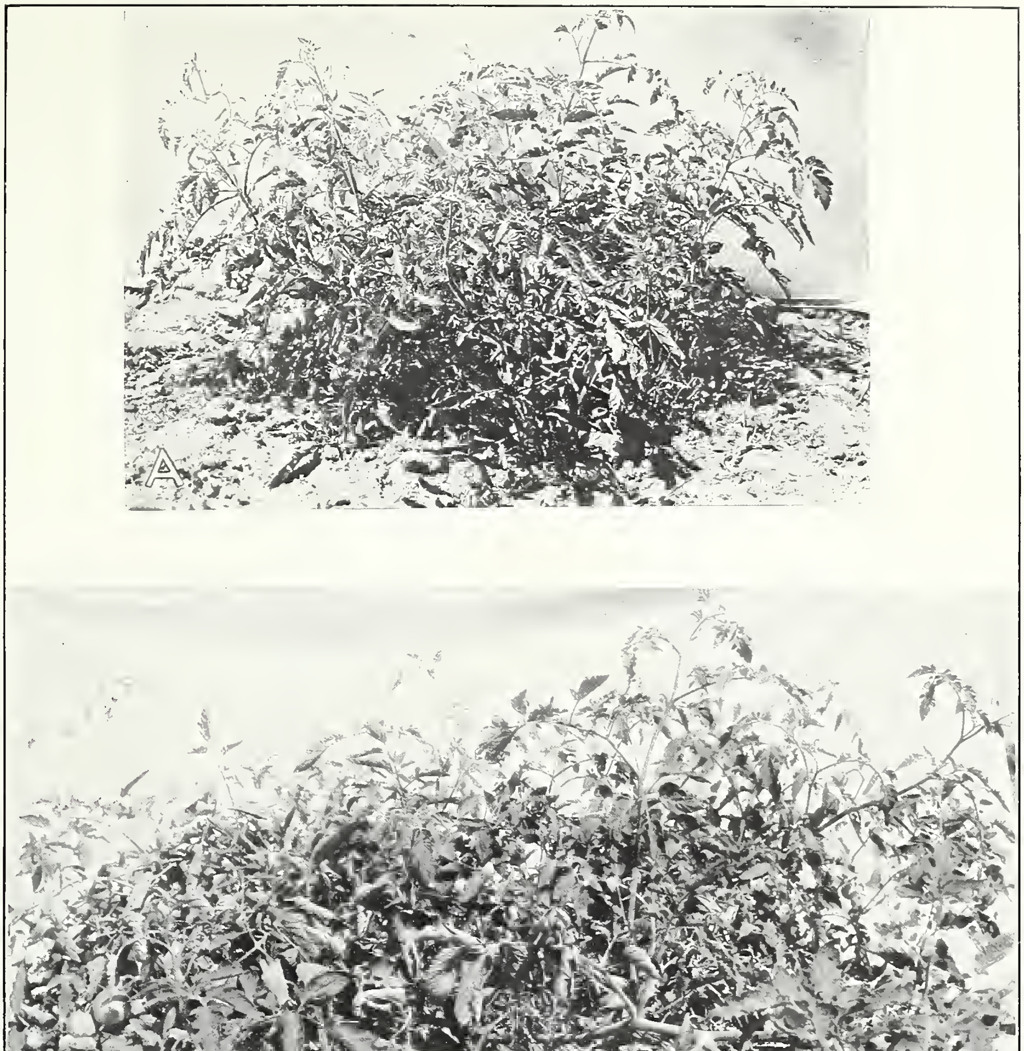
PLATE 13



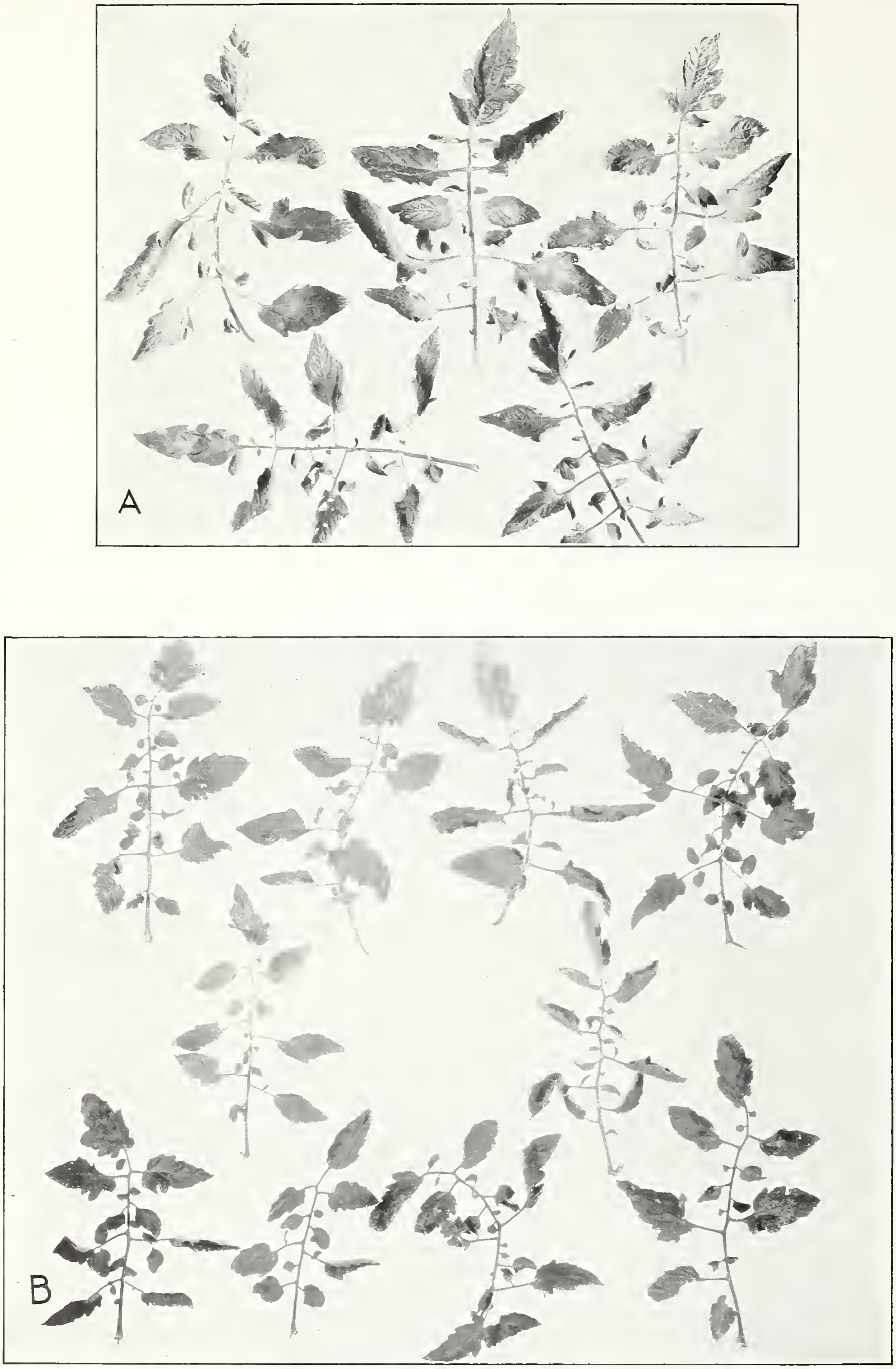
L. C. C. Krieger, Pinx.

Lith. A. Hoen & Co., Inc.

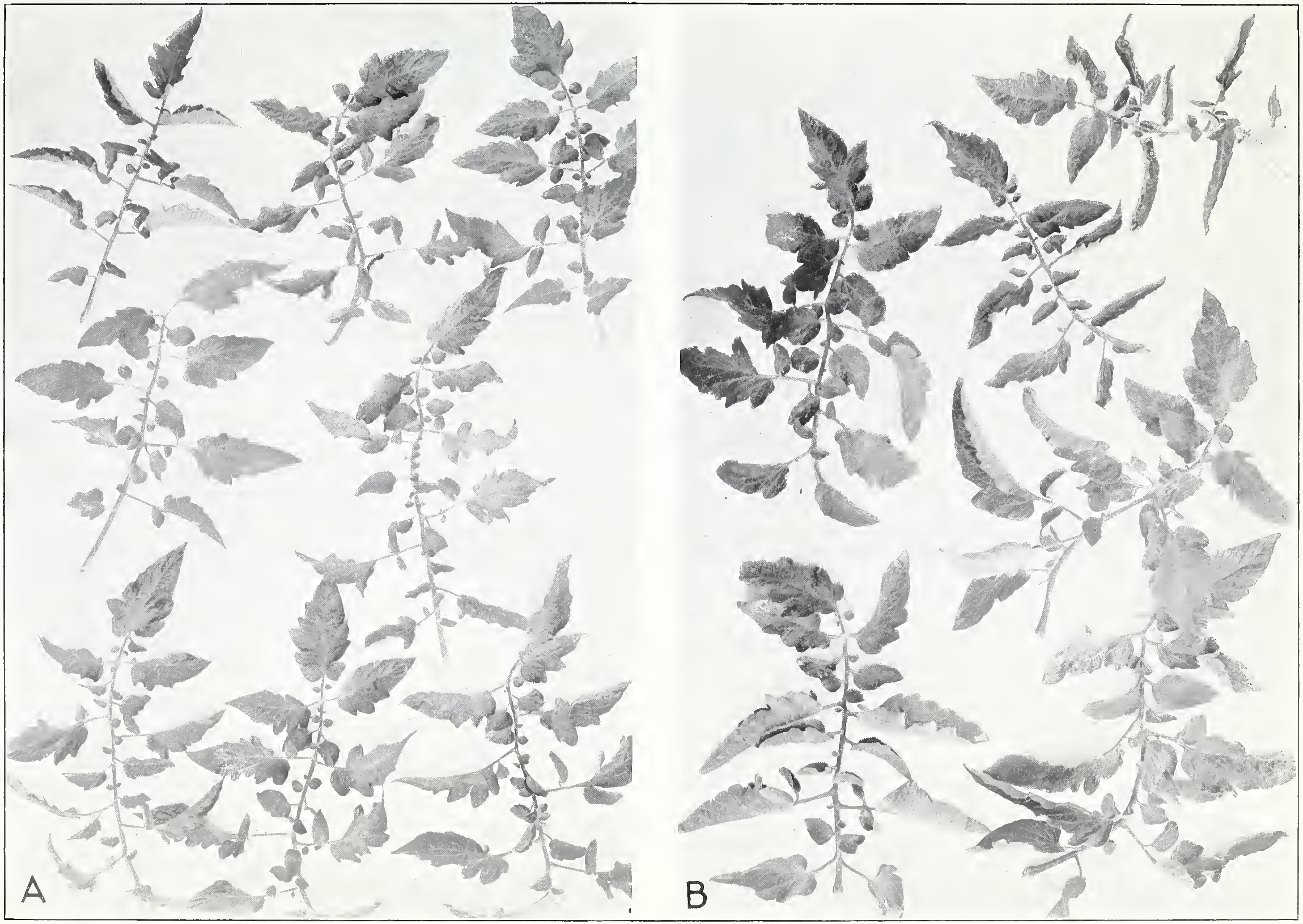
Cross sections of tomato fruits: A, Earliana; B, Bonny Best; C, Globe; D, Marglobe; E, Stone. All natural size.



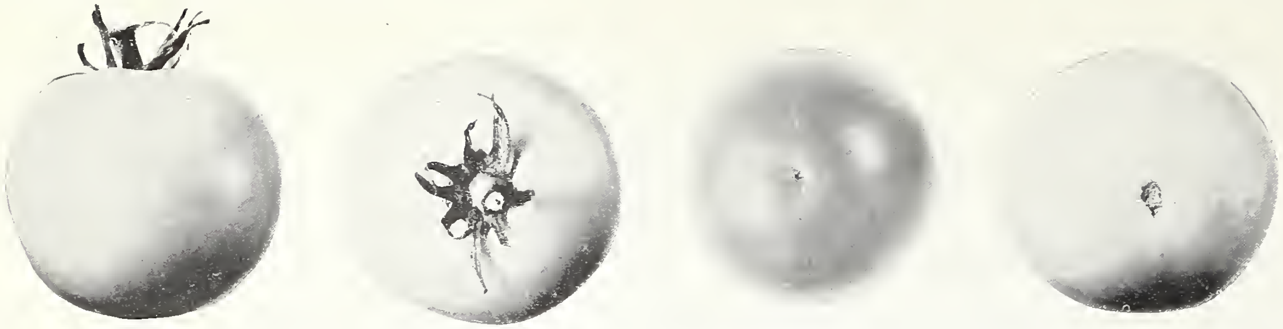
Plants of Globe, average growth: A, At first harvest; B, soon after first harvest; C, at peak of harvest.



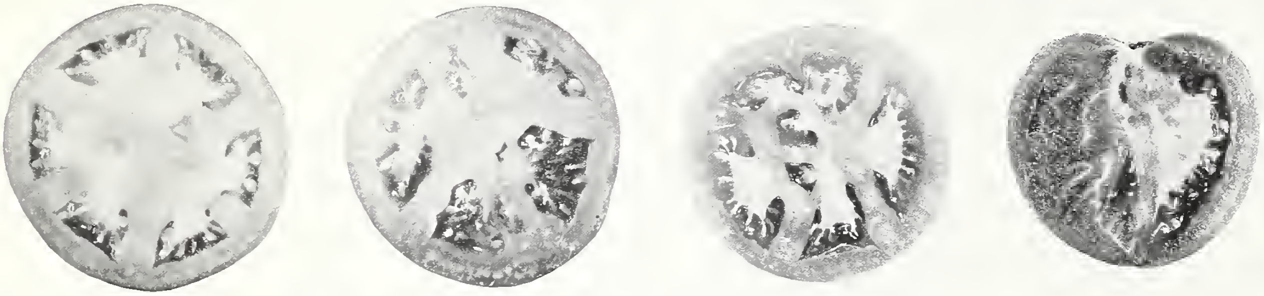
Leaves of Globe, showing differences between seasons and localities: A, Grown at Washington, D.C., 1929; B, grown at Davis, Calif., 1931.



Tomato leaf form is often of little or no value in identifying many varieties: A, Globe; B, Marglobe. (Grown at Davis, Calif.) × ⅕.

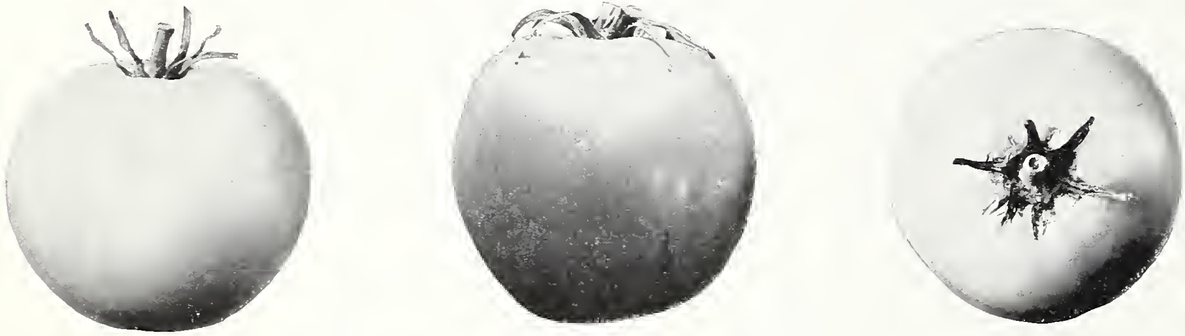


Standard Standard Standard Acceptable, but scar rather large

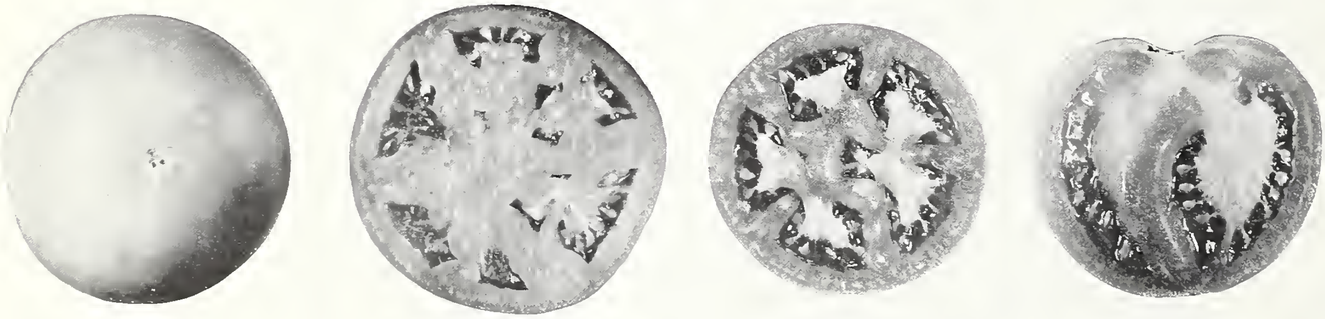


Standard Acceptable, but irregular Acceptable, but walls rather thin Standard

A



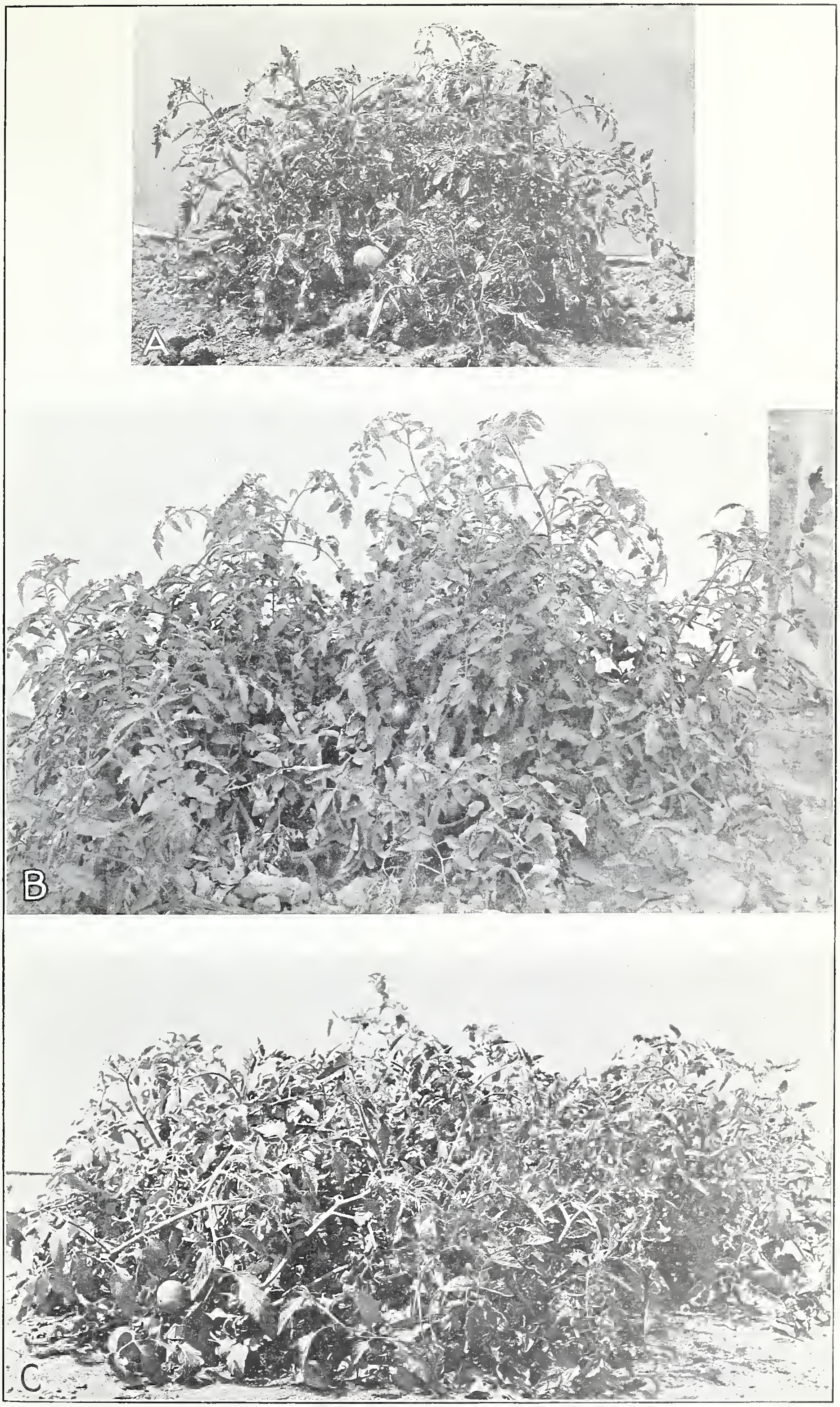
Standard Excellent, but deeper than is typical Standard



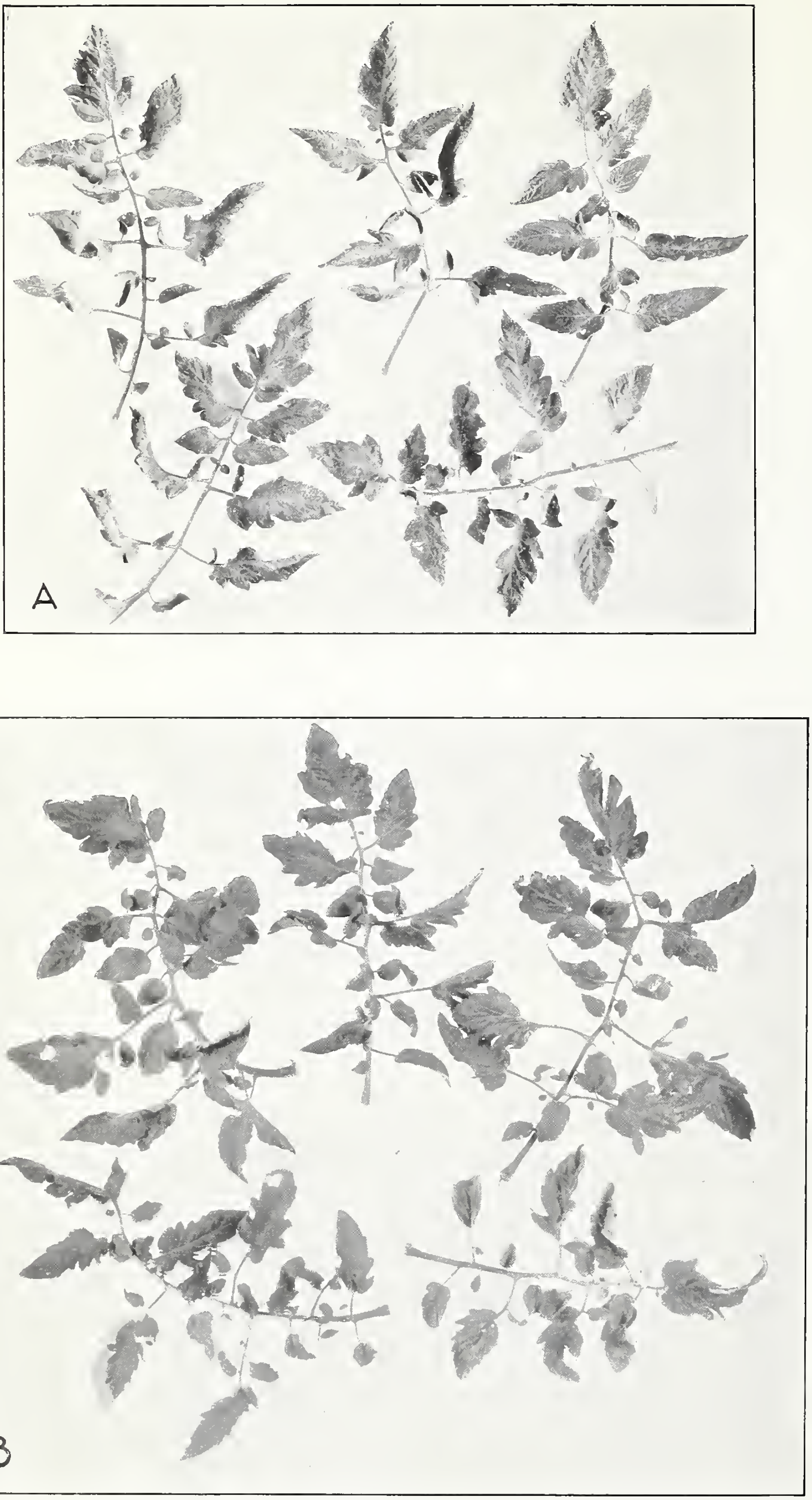
Standard Standard Acceptable, but inner walls thin Standard

B

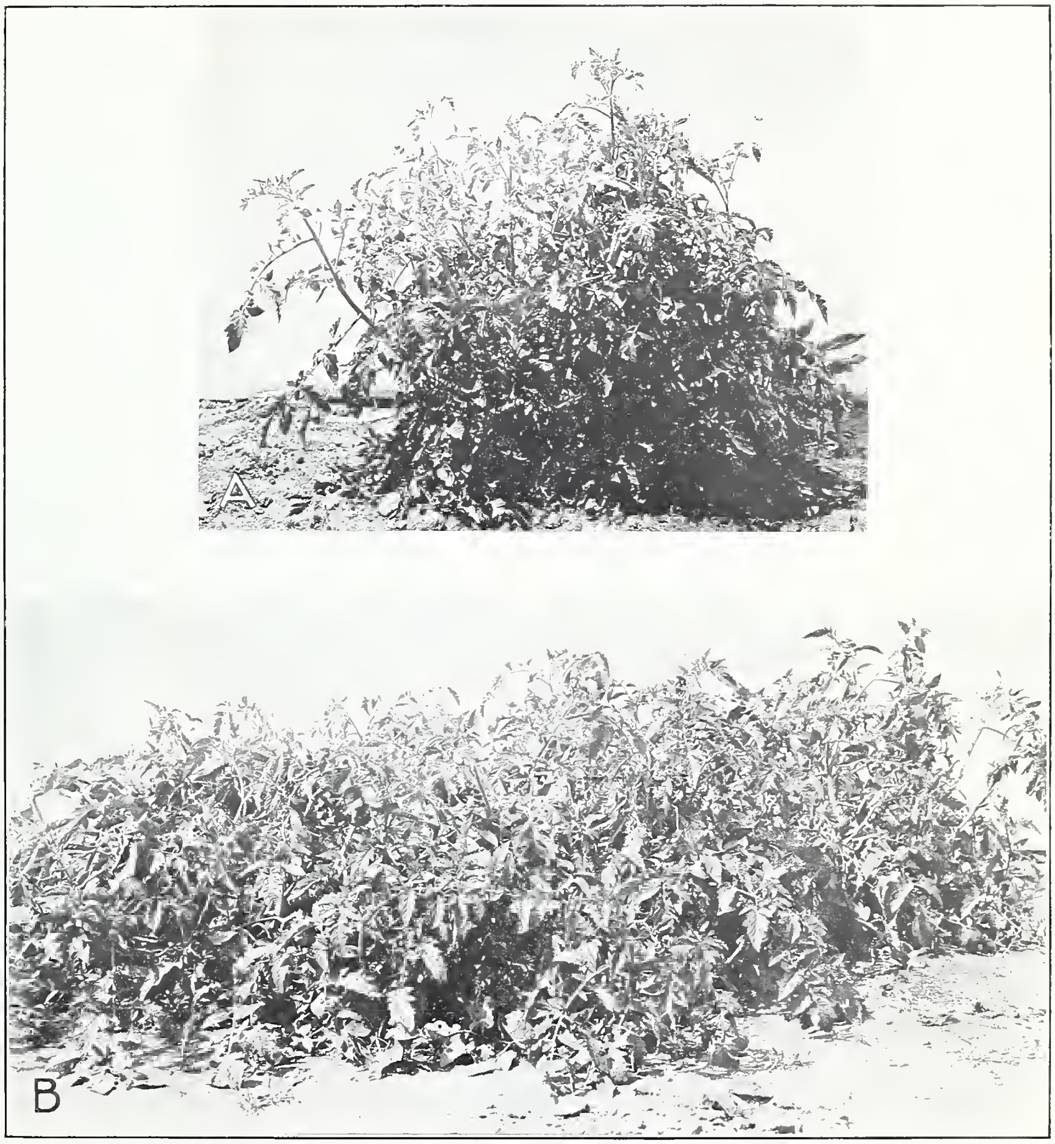
Tomato fruits: A, Globe; B, Marglobe. × ½.



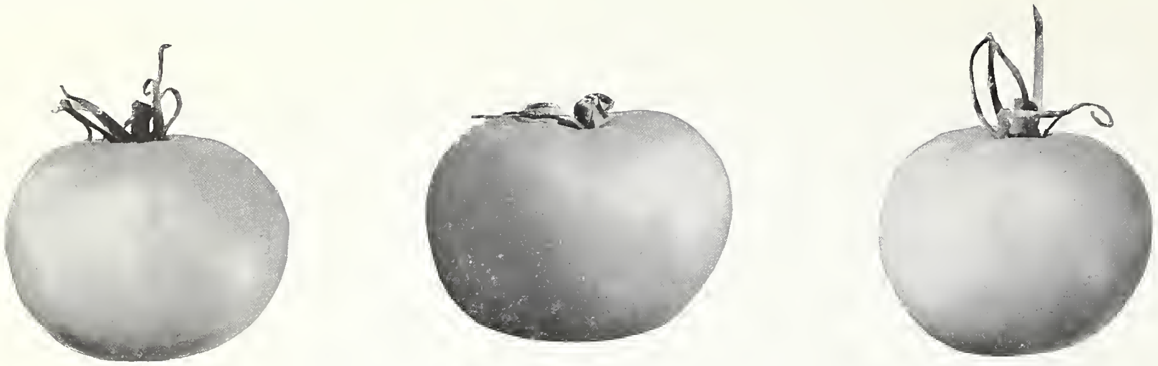
Plants of Marglobe, average growth: A and B, At first harvest; C, at peak of harvest.



Leaves of Marglobe, showing differences between seasons and localities in which grown: A, Grown at Washington, D.C., 1929; B, grown at Davis, Calif., 1931. × ⅕.



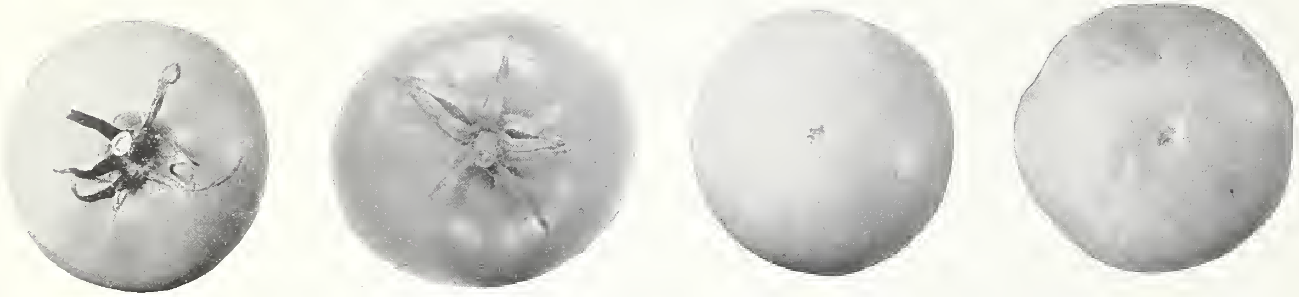
Plants of Early Detroit, average growth: A, At first harvest; B, at peak of harvest.



Standard

A common type but too shallow

Excellent form, but deeper than is typical

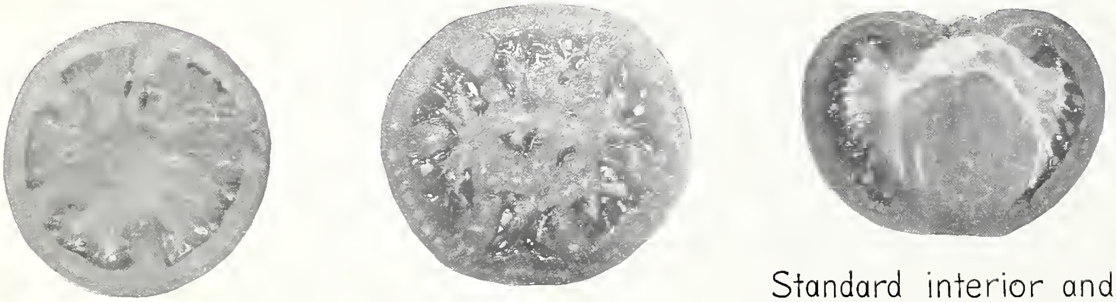


Standard

Acceptable, but slightly oblong

Standard

Acceptable, but rather angular

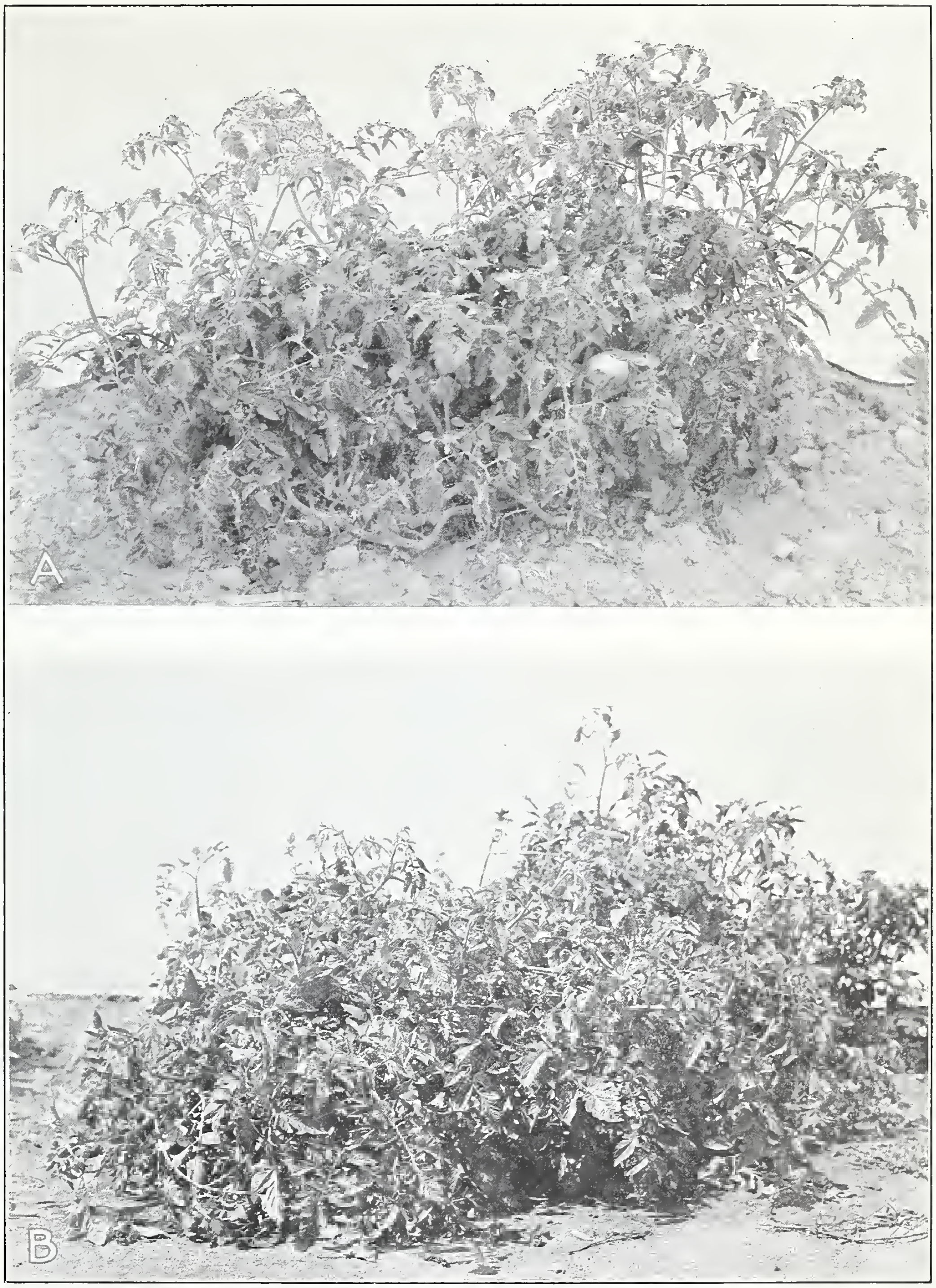


Standard

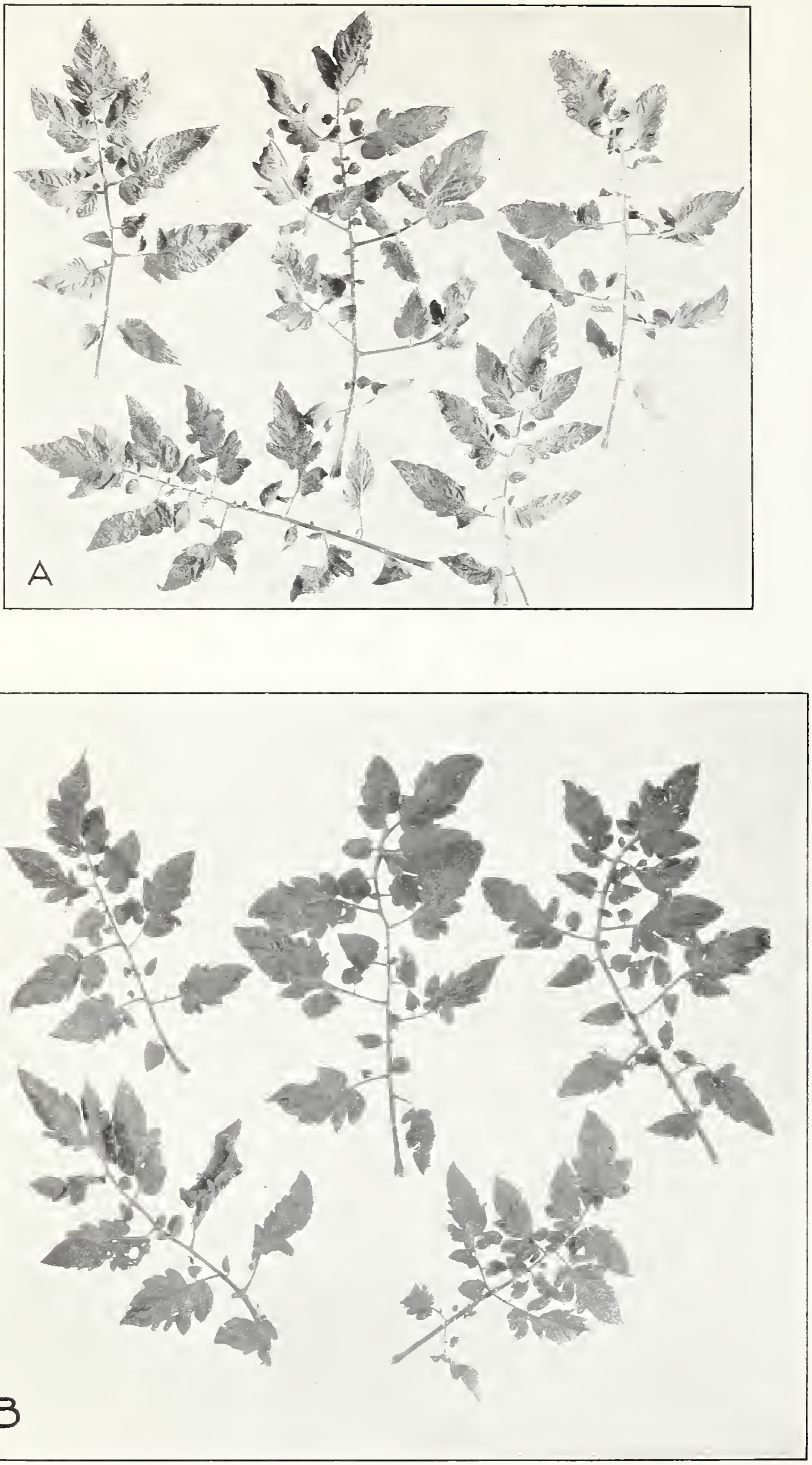
Acceptable, but rather irregular

Standard interior and flattened blossom end

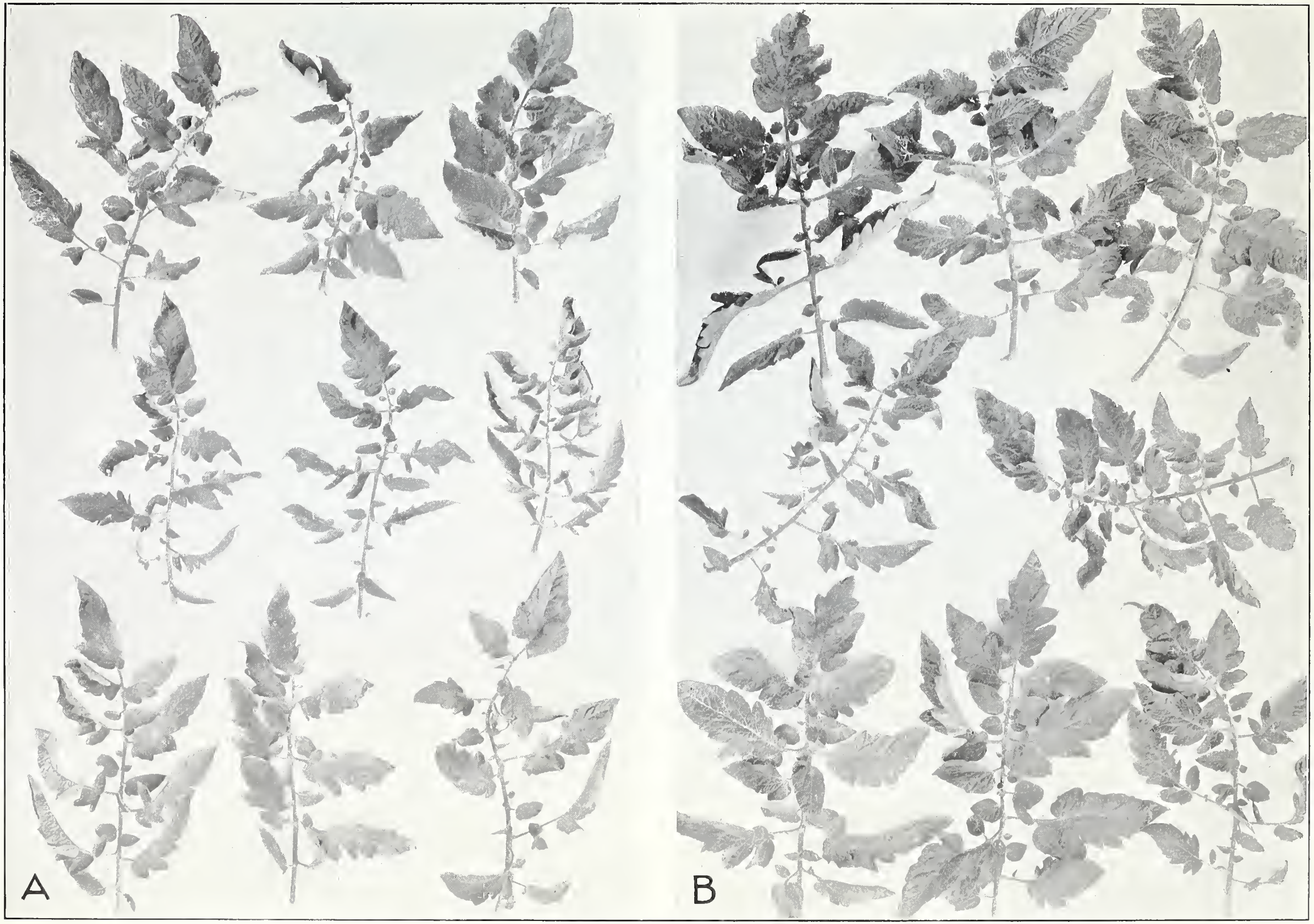
Fruits of Early Detroit. × ½.



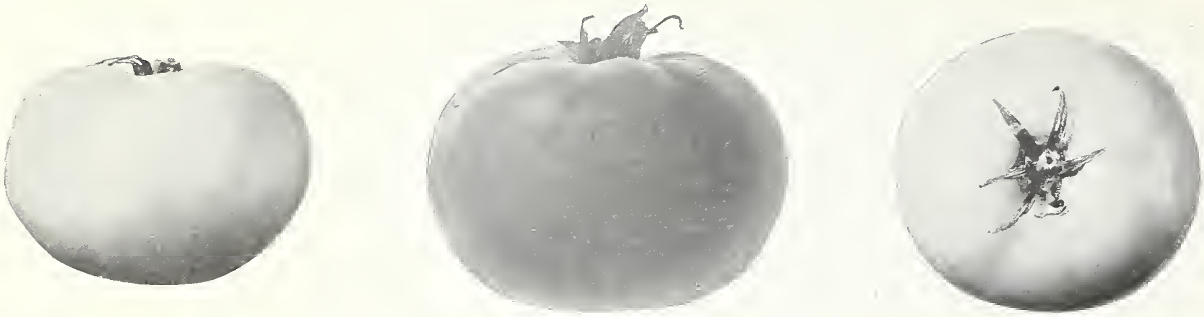
Plants of Greater Baltimore, average growth: A, At first harvest; B, at peak of harvest.



Leaves of Greater Baltimore, showing differences between seasons and localities in which grown: A, Grown at Washington, D.C., 1929; B, grown at Davis, Calif., 1931. × ⅕.



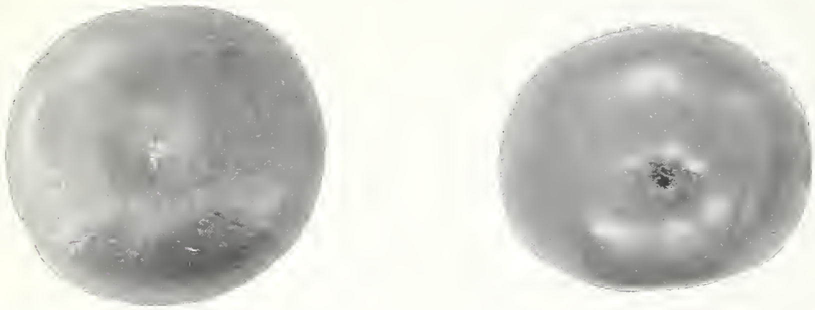
Tomato leaves, grown under identical conditions, but showing that those of Stone are fairly distinct from those of Greater Baltimore: A, Greater Baltimore; B, Stone.



Standard

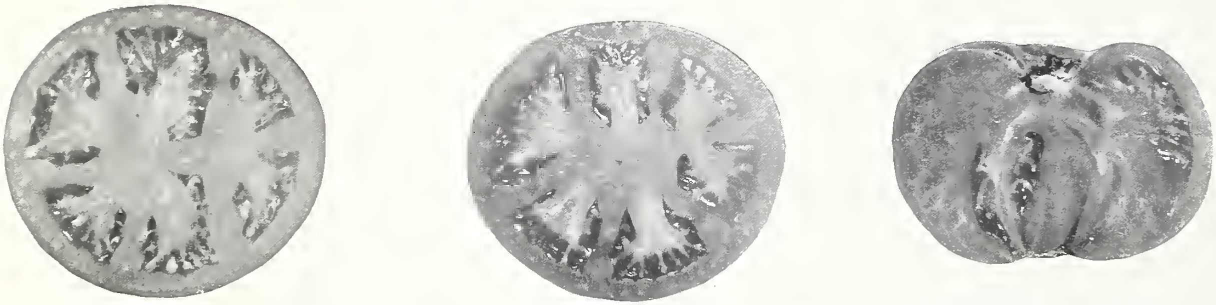
Acceptable, but larger and deeper than is typical

Standard



Small scar; typical of some strains

Standard. Large scar typical of most strains

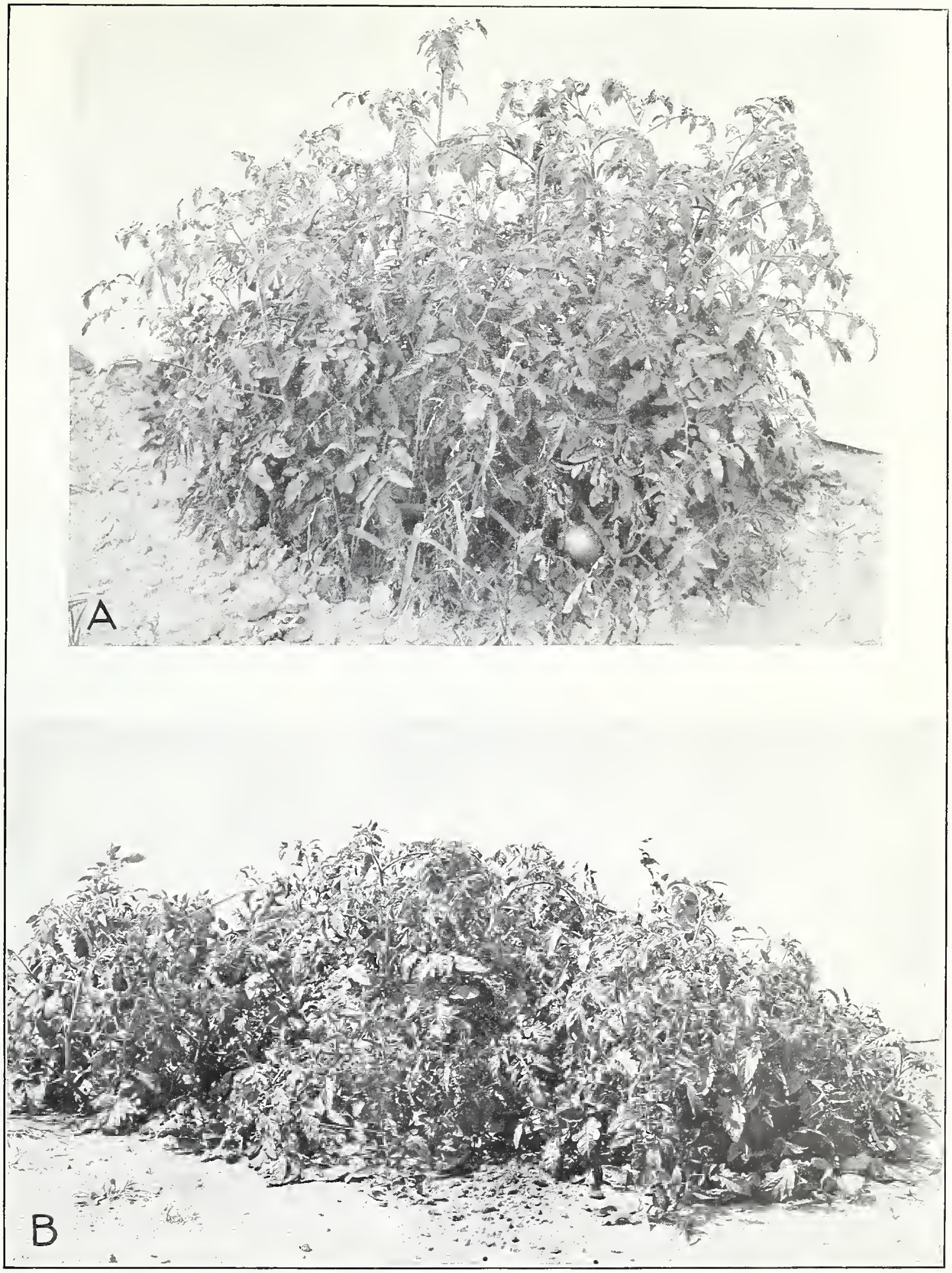


Standard

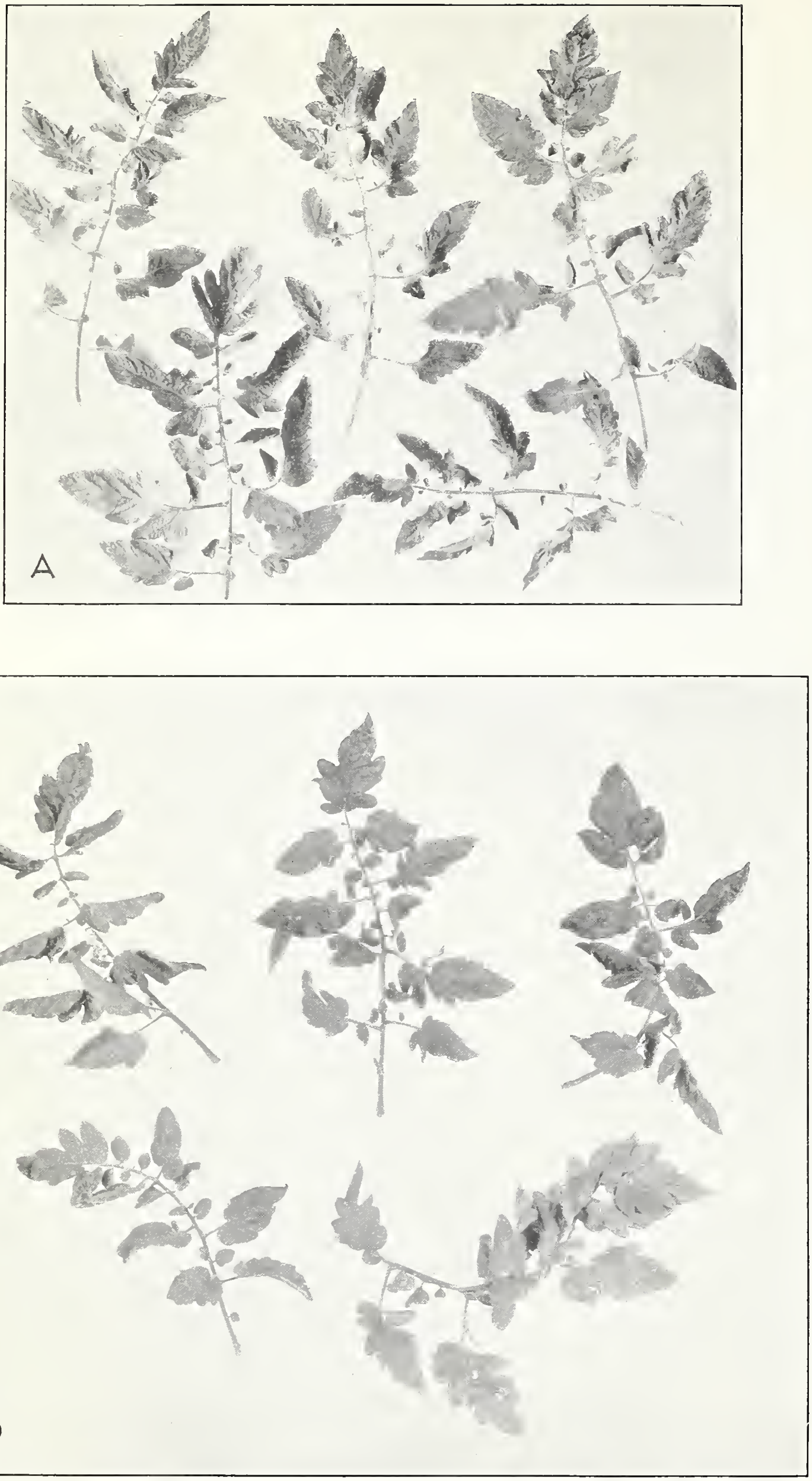
Standard

Standard Interior

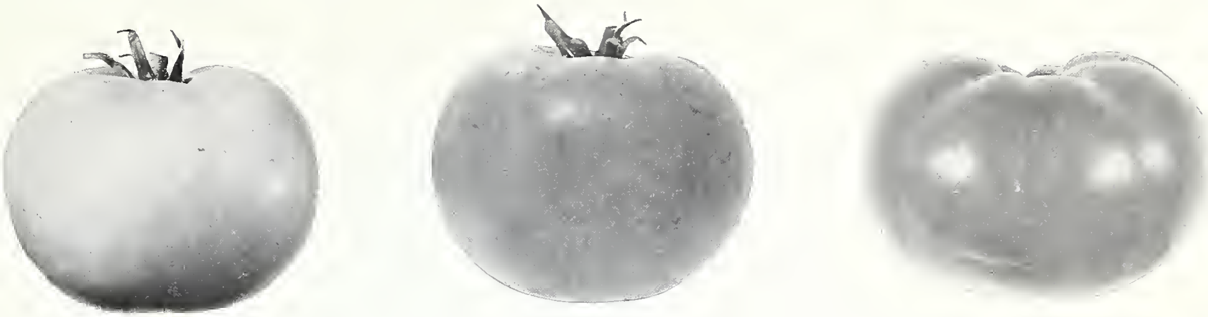
Fruits of Greater Baltimore. × ½.



Plants of Stone, average growth: A, At first harvest; B, at peak of harvest.



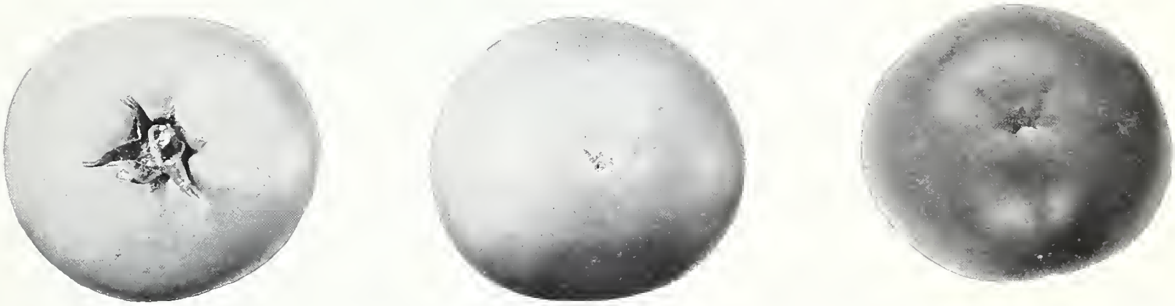
Leaves of Stone, showing differences between seasons and localities in which grown: A, Grown at Washington, D.C., 1929; B, grown at Davis, Calif., 1931.



Standard

Excellent form, but deeper than is typical

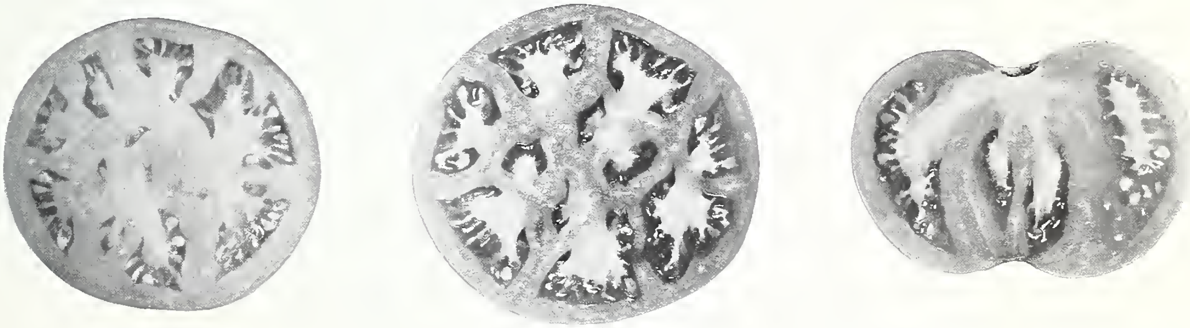
Cavity rather rough and fruit somewhat too shallow



Standard

Standard

Acceptable, but basin rather prominent

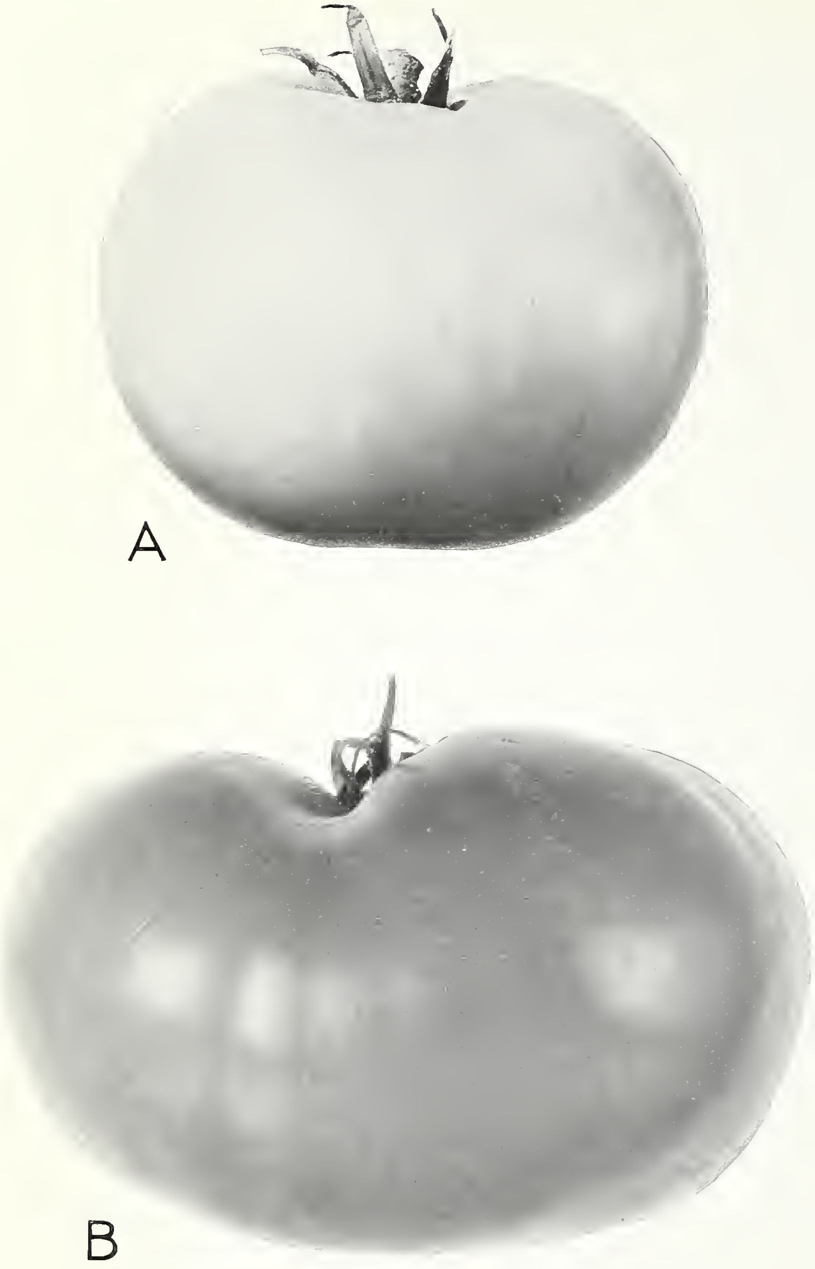


Standard

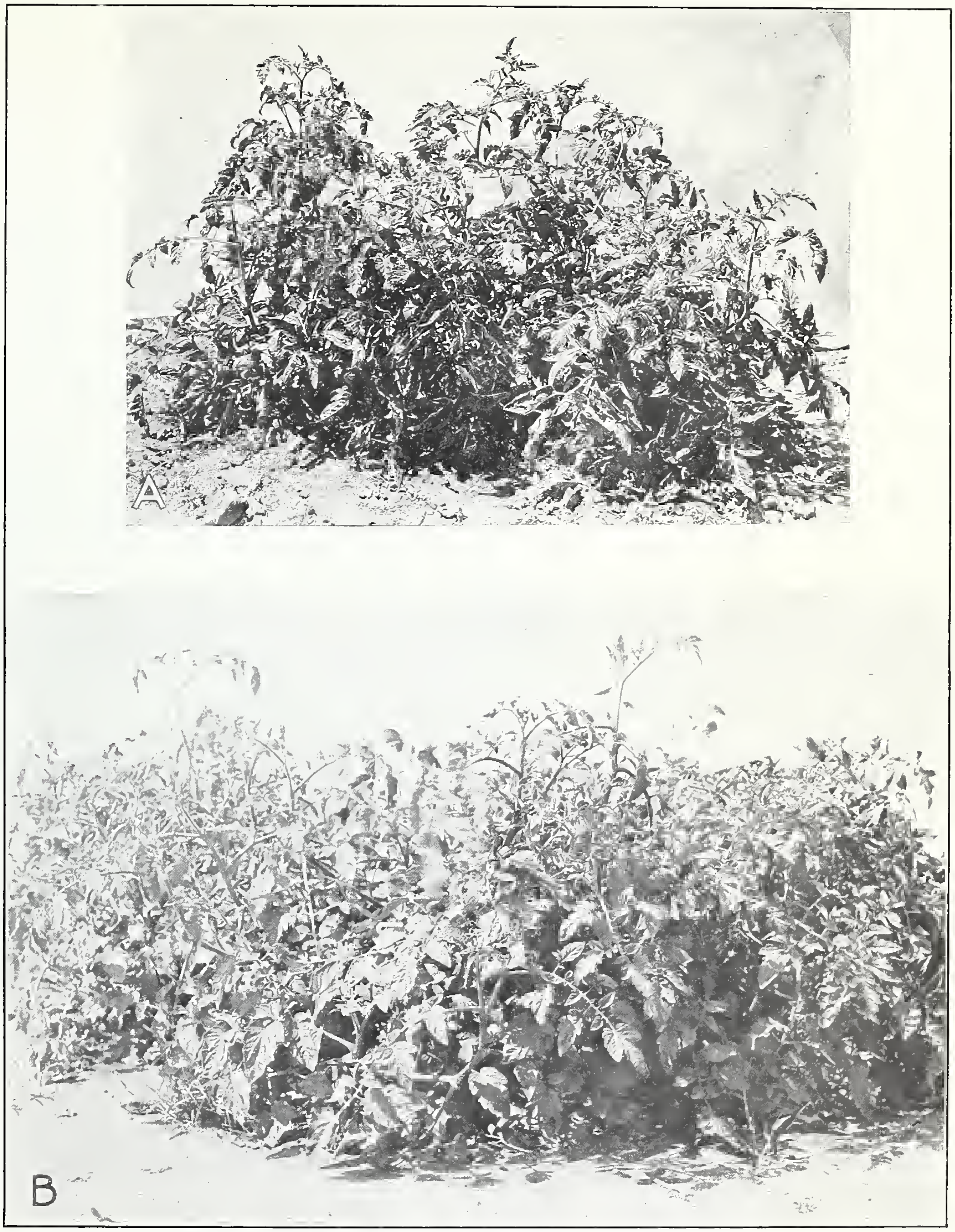
Acceptable, but walls rather thin

Acceptable interior, but basin rather prominent

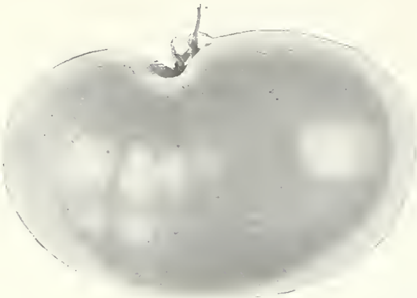
Fruits of Stone. × ½.



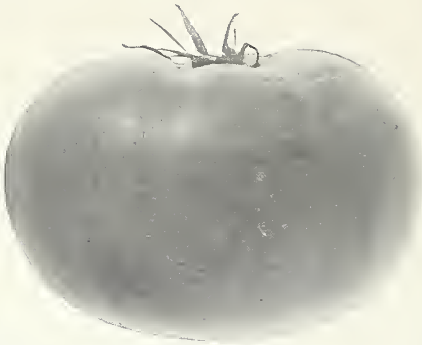
Fruits of (A) Stone; (B) Santa Clara. Both natural size.



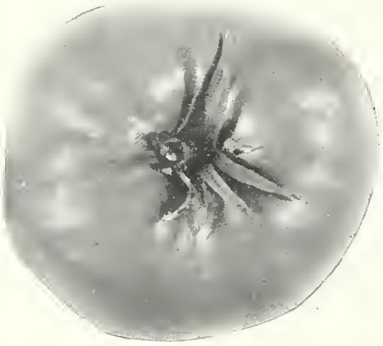
Plants of Santa Clara, fair growth: A, At first harvest; B, at peak of harvest.



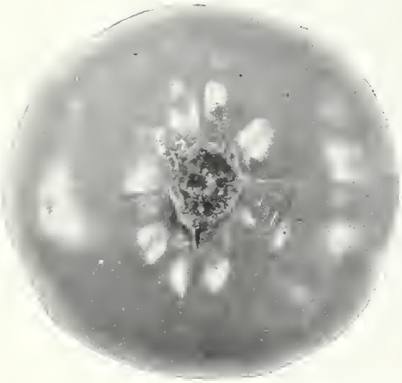
Standard



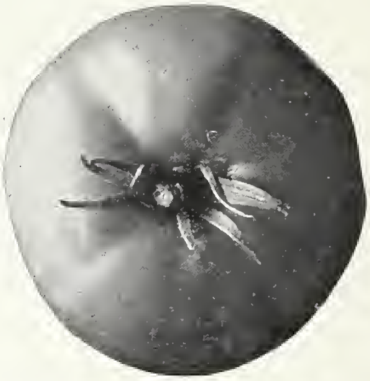
Excellent, but deeper
and smoother than typical



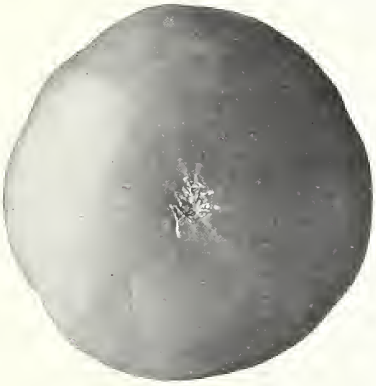
Standard



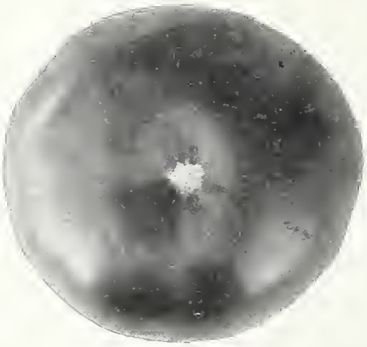
Excellent, but more nearly
round than is typical



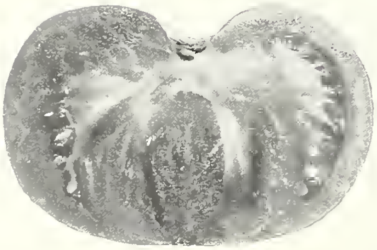
Very desirable, but
better than is typical



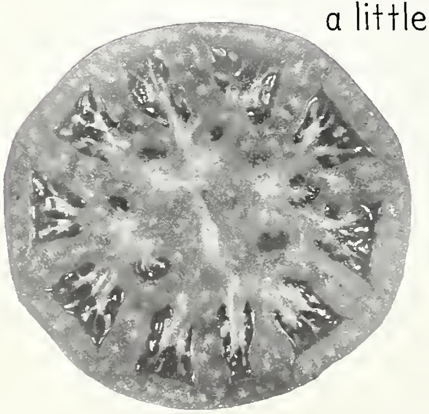
Standard



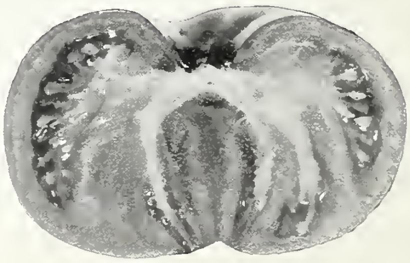
Acceptable, but basin
a little deep



Standard interior



Standard



Acceptable, but
cavity rather large

Fruits of Santa Clara. × ½.

U. S. GOVERNMENT PRINTING OFFICE: 1933

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